# A TEXTBOOK OF
# RASAŚĀSTRA

DR. RAVINDRA ANGADI

## IATRO-CHEMISTRY AND AYURVEDIC PHARMACEUTICS

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*

Chapter 1

# RASAŚĀSTRA : ITIHĀSA EVAM KRAMIKA VIKĀSA

## (History and Chronological Development of Rasaśāstra)

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**Rasa- definitions:**

In 'Rasaśāstra', the term rasa is indicative of 'pārada' (mercury). Rasa (mercury) is a silver colored liquid metal which is scientifically identified as 'Hydrargyrum' or 'Quick silver'.

Its symbol is Hg, Atomic weight 200.6; Specific gravity 13.6 and Boiling point $357^{0}$C. By nature, it is capable of digesting other metals and minerals that come in contact with it. Therefore, it is defined as;

रसनात् सर्वधातूनां रस इत्यभिधीयते । जरारुङ्मृत्युनाशाय रस्यते वा रसो मतः ।।

(R. R. S. 1/77)

Since the mercury does, the 'rasana' or 'āswādana' (engulf) of 'abhrakādi rasa dravya' and 'swarṇādi dhātu' it is called as 'RASA'.

Since its judicious therapeutic use slows down aging process (jarā), heals many diseases (ruja) and delays death (mṛtyu) it is called as 'RASA'.

रसनात् सर्वधातूनां रस इत्यभिधीयते । रसति भक्षयति सर्वान् लोहान् इति रसः ।

The one, which can digest all the other metals and minerals in it, is called as rasa.

रसोपरसराजत्वात् रस इत्यभिधीयते ।

The one, which is most prominent out of all the mahārasa, uaparasa and sādhāraṇa rasa dravya is called 'rasarāja' i.e. pārada.

रसत्वाद् द्रवरूपत्वात् रसः ।

The one, which is remains in liquid state is called as rasa.

(Rasārṇava)

मम देहरसो यस्माद् रसस्तेनायमुच्यते ।

The essence or the śukra of 'Lord Śiva' is called as 'rasa'.

**Rasa- etymology:**

The term rasa can be meant differently in different contexts of 'Sanskrit literature' and the classics of Āyurveda;

1. The term rasa is meant as enjoyment or interest in spoken Sanskrit. It is also meant as the taste of enjoyment.

2. Rasa is taste experienced by the taste buds in the tongue (rasanā).
3. Rasa is swarasa (the juice extracted) or the niryāsa (exudate) of herbal drugs.
4. Rasa is the first dhātu (out of saptadhātu) of the body.
5. Rasa word is indicatives of emotions expressed, like śṛṅgāra rasa, hāsya rasa, roudra rasa etc.
6. Rasa is meant to be 'Brahma'—the creator, as per 'Vedic literatures'.
7. Rasa is meant as 'jala' (water) in some contexts.
8. Rasa is also meant as 'amṛta' (nectar).
9. In the present context 'rasa' word is synonymous for 'pārada', as this metal remains in liquid state at room temperature.

## ORIGIN AND BRIEF HISTORY OF 'RASAŚĀSTRA'
## (Indian Alchemy)

The origin of 'Rasaśāstra' has its roots in the ' Indian alchemy'. Alchemy was a form of chemistry studied in the medieval period, in which people tried to discover different ways to change ordinary metals into gold. This practice went on for centuries, yielding some of the significant findings in the field of alchemy.

History of 'Indian alchemy' can be traced to pre-Vedic period. The archaeological excavations at Mohenjodaro and Harappa in the 'Indus valley' have brought to light that, the people in ancient India were possessing chemical knowledge as early as in the pre-historic period.

In Vedic period, single herbs were used for medication. Minerals and animal substances were also in use but no compound preparations were prepared.

Alchemy in India was started for the preparation of a 'potion' of life for imparting immortality and later for the transmutation process for converting ordinary metals into gold. Indian alchemy derived its colour and flavour largely from the Tantric cult.

Then, in later centuries, all the previous accumulated alchemical ideas were put to practical use and a number of preparations of mercury and other metals were evolved as helpful accessories in medicine.

'Rasaśāstra' or the Āyurvedic alchemy is an important branch of Āyurvedic pharmacology. This branch deals with the use of metals, minerals, gemstones and their processing. In the ancient Āyurveda the emphasis has been over the herbs and their therapeutic usages.

Later on the animal products, metals and minerals started to find favor of the Āyurvedic practitioners. The minerals and metals are very effective and potent for immunization, rejuvenation and the elimination of diseases.

Etymologically speaking the term 'Rasaśāstra' is derived from the words 'rasa' (mercury) and 'śāstra' (literature). In 'alchemy', the primary motto was conversion of ordinary metals into gold, which is a higher and valuable metal.

The experts applied the same analogy to the human body and found out that the 'śārīrika dhātu' can also be enriched in the same way by the use of different metals. This study came to be known as the 'dehavāda'.

The study of dehavāda and the use of metals were successful and it was found that the mercury was very useful and effective when compared to its other mineral and herbal counterparts.

In the earlier days, tantrics made use of the 'rasa cikitsā methods' for achieving immortality and these experiments were later utilized for the Āyurvedic treatments.

The modern Indian Āyurveda makes an extensive use of the 'Rasaśāstra' so much so that it has become the vital or inseparable component of the therapeutic process.

We all know that, 'Rasaśāstra' is not counted among the eight branches of Āyurveda. This is indicative of the fact that 'Rasaśāstra' in its initial days was developed as an independent pharmaceutical science.

Eventually, 'Rasaśāstra' became a significant part of Āyurveda and has played a major role in the development of this science in later centuries.

'Rasaśāstra' is the special science, which deals with the metallic, mineral and poisonous drugs. These drugs are pharmaceutically processed and rendered fit for internal administration.

**Vedic period:**

The references for 'rasa dravya' and their use for therapeutic purposes may be readily traced from all the three 'bṛhattrayī' (Caraka Saṁhitā, Suśruta Saṁhitā and Aṣṭāṅga Hṛdaya).

**Caraka Saṁhitā:**

This book belonged to 2-3 century B. C. originally written by Maharṣi Agniveśa, pratisaṁskaraṇa done by Maharṣi Caraka and completed by adding few of the chapters by Dṛḍhabala. It has 8 sthāna 120 chapters in it.

During the era of this book, the 'dhātu-śāstra' (rasaśāsatra) was not a familiar mode of treatment. The herbal drugs and their formulations were prominently used for the therapeutic purposes. However, the reference for **'Lauhādi rasāyana' (ayaskṛti)** is found in 1st chapter, 3rd pāda of Cikitsā Sthāna; 1: 3/ 15-23; Rasāyanādhyāya, which is indicative of knowledge about the rudimentary idea of using metallic and mineral drugs for the purpose of treatment.

Rasa dravya: Mineral drugs that are used for therapeutic purposes in this book are; śilājatu, haratāla, manaḥśilā, tuttha, swarṇa mākṣika, roupya mākṣika, gandhaka, añjana, rasāñjana, puṣpāñjana, sroto-añjana, souvīrāñjana, svarṇagairika and sphaṭika.

Dhātu: Metallic drugs that are used for medicinal purposes are svarṇa, rajata, tāmra, loha, nāga, vaṅga, kāṁsya, pittala and maṇḍūra.

Ratna: The precious stones that are used for medicinal purposes are māṇikya, muktā, puṣparāga, pravāla, vajra, vaiḍūrya, sūryakānta, nāgamaṇi, sphaṭika, śaṅkha and śukti.

**Suśruta Saṁhitā:**

This book belonged to 2nd century A.D. written by Maharṣi Suśruta. Pratisaṁskaraṇa of the book was done by Ācārya Nāgārjuna in 4th century A.D. and pāṭha śuddhīkaraṇa by Ācārya Candraṭa in 10th century A.D. This book also has 5 sthāna and 120 chapters in it.

During the era of this book, the 'dhātu-śāstra' (rasaśāsatra) was not a familiar mode of treatment. The herbal drugs and their formulations were prominently used for the therapeutic purposes. However, the reference of **'Auṣadha ayaskṛti'** and **'Mahā auṣadha ayaskṛti'** is found in10th chapter of cikitsā sthāna during Mahākuṣṭhacikitsā, which is indicative of knowledge about the crucial idea of using metallic and mineral drugs for the purpose of treatment.

Rasa dravya: Mineral drugs that are used for therapeutic purposes in this book are; śilājatu, haratāla, manaḥśilā, tuttha, mākṣika, kāsīsa, sphaṭika, añjana, ṭaṅkaṇa, rasāñjana and gandhaka.

Dhātu: Metallic drugs that are used for medicinal purposes are svarṇa, rajata, tāmra, loha, nāga, vaṅga, kāṁsya, pittala and maṇḍūra.

Ratna: The precious stones that are used for medicinal purposes are māṇikya, muktā, puṣparāga, pravāla, vajra, vaiḍūrya, sūryakānta, nāgamaṇi, sphaṭika, śaṅkha and śukti.

### Aṣṭāṅga Saṅgraha and Aṣṭāṅga Hṛdaya:

Aṣṭāṅga Saṅgraha was written by 'Vṛddha Vāgbhaṭa' in 6th century A.D. with 6 sthāna and 150 chapters. Aṣṭāṅga Hṛdaya of Laghu Vāgbhaṭa is concise version of the main book Aṣṭāṅga Saṅgraha written by Vṛddha Vāgbhaṭa. So the theories put forward in both the books are from the same base.

During the era of this book the scope for 'rasaśāsatra' or 'dhātu-śāstra' had become more evident. The first glimpse of 'dhātu bhasmīkaraṇa' (metallic incineration) is seen in this book in rudimentary stage.

The reference of **'Ayaskṛti'** is found in 'Aṣṭāṅga Hṛdaya', Cikitsā Sthāna 12/ 28-32; for Prameha cikitsā. In this book we find the first reference of 'andha mūṣā'.

Rasa dravya: Mineral drugs that are used for therapeutic purposes in this book are; pārada, śilājatu, haratāla, manaḥśilā, kāṅkṣī, kāsīsa, gandhaka, gandha-pāṣāṇa, gairika, mākṣika (swarṇa and roupya), tuttha, souvīrāñjana and srotāñjana.

Dhātu: Metallic drugs that are used for medicinal purposes are ayaskṛti, ayoraja, ayomala (maṇḍūra), swarṇa, rajata, tāmra, loha, nāga, vaṅga, kāṁsya, kṛṣṇaloha raja, tīkṣṇaloha and rītipuṣpa (puṣpāñjana).

Ratna: The precious stones that are used for medicinal purposes are māṇikya, muktā, pravāla, puṣparāga, vajra, vaiḍūrya, sūryakānta, sphaṭika, nāgamaṇi, gardhabhamaṇi, gajamuktā, śaṅkha, śukti, varāṭikā and samudraphena.

### Rasācārya:

There are many 'Ācārya' who have contributed in the development of 'dhātu-śāstra' or 'Rasaśāstra'. The number and the names of these ācāryas differ from one reference to the other. The prominent names that are usually counted as 'rasācārya' are; Vyāḍi (Vyāḍācārya), Nāgārjuna, Candrasena, Bāṇāsura, Lampaṭa, Muniśreṣtha, Kapila, Naravāhana, Surānanda, Māṇḍavya, Vāḍava, Kāpālika, Tātvika, Śārada, Govinda, Bhāskara, Indrada, Sātvika, Gomukha, Brahmā, Hari, Ratnakoṣa, Kambalī etc.

### Nātha and Siddha sampradāya:

There are many seers who belong to 'nātha sampradāya' and 'siddha sampradāya' (depending on their names) who have immensely contributed in the development of 'Rasaśāstra'. Their names are as mentioned below;

Nine Nātha: 1. Ādinātha 2. Mīnanātha 3. Gorakhanātha 4. Koṅkaśwara nātha

5. Jālandhara nātha 6. Kandhanīśa nātha 7. Uḍḍīśa 8. Ciñciṇīśwara nātha and 9. Couraṅgīnātha.

Sixteen Siddha: 1. Couraṅgī siddha 2. Carpaṭī sidda 3. Ghoḍā cūlī siddha 4. Rāma siddha 5. Bholā siddha 6. Govinda siddha 7. Vyāḍi siddha 8. Nāgārjuna siddha 9. Koraṇḍa siddha 10. Śūrpakarṇa siddha 11. Muktāyī siddha 12. Revaṇa siddha 13. Kukkurapāda siddha 14. Śūrpapāda 15. Kaṇairava siddha and 16. Kiṅkiṇika siddha.

**Alberuni and Vyāḍi:**

'Abū al-Rayḥān Muḥammad Aḥmad al-Bīrūnī' (born 5 September 973 in Kath, Khwarezm, now region in Uzbekistan, died 13 December 1048 in Ghazni), known as Alberonius in Latin and Al-Biruni in English, was a Persian-Chorasmian Muslim scholar and polymath of the 11th century.

Al-Biruni is regarded as one of the greatest scholars of the medieval Islamic era and was well versed in physics, mathematics, astronomy, and natural sciences, and also distinguished himself as a historian, chronologist and linguist.

He was conversant in Chorasmian, Persian, Arabic, Sanskrit, and also knew Greek, Hebrew and Syriac. He spent a large part of his life in Ghazni in modern-day Afghanistan, capital of the Ghaznavid dynasty which ruled eastern Iranian lands and the northwestern Indian subcontinent.

In 1017 he traveled to the Indian subcontinent and became the most important interpreter of Indian science to the Islamic world. He is given the titles the "founder of Indology" and the "first Anthropologist".

He was an impartial writer on custom and creeds of various nations, and was given the title *al-Ustdadh* ("The Master") for his remarkable description of early 11th-century India.

He also made contributions to Earth sciences, and is regarded as the "father of geodesy" for his important contributions to that field, along with his significant contributions to geography.

Alberuni stayed in Indian subcontinent and studied Sanskrit from Indian seers for 33 years. He has mentioned about 'Vyāḍi' or 'Vyāḍyācārya' in detail. There are many fascinating stories about 'Vyāḍyācārya' and his experiments with the loha-śāstra (alchemy).

As per Alberuni, Vyāḍyācārya belongs to Avantipura province of king

Vikramāditya. He invested all his life and wealth on experimentations in alchemy and documented all his finding in the form of a book.

When all his lifelong efforts yielded nothing to him, he was utterly upset. He went on to the 'śiprā' river bank and sat there for long thinking about his lost wealth and wasted life.

Finally he started tearing each page of this book and threw them one by one into the river. On the lower side of the river a woman found the these papers floating down the river and collected all of them in curiosity. She brought all of them up the river where 'Vyāḍyācārya' was still sitting.

When she asked him about the papers floating over river current, he narrated all the miseries he has incurred in his life because of the work he was behind. He said that he has ruined his life because of all this and has no wealth left out to pursue it further.

Then the women consoled 'Vyāḍyācārya' and urged him to continue pursuing his work by the support of her wealth. Later 'Vyāḍyācārya' started working again on his experimentations in alchemy.

One day when he was cooking some oil in his hut, he was accidentally hit on his forehead by the roof of his small hut and there was bleeding. While stirring the vessel containing oil, few drops of the blood from his forehead tricked into the oil. Soon, the 'tailapāka' was over.

Later when Vyāḍyācārya and his wife consumed this oil and they started floating high in the sky (khecari tantra). Wherever the Vyāḍyācārya spat from above, the spit turned into gold.

Note: This story is full of fantasies; it is given only for the fascination it generates among the readers. The story here tries to convey the strength and enigma of alchemy.

**Nāgārjuna:**

Ācārya Nāgārjuna is one among the prominent seers of 'Rasaśāstra'. The history reveals, more than one 'Nāgārjuna' up to 8th century. Among these references, two persons named 'Nāgārjuna' were closely associated with 'Rasaśāstra'. They are;

1. Siddha Nāgārguna and
2. Bhikṣu Nāgārjuna

**Siddha Nāgārguna:** Nagarjuna was an Indian metallurgist and alchemist, born at Fort Daihak near Somnath in Gujarat in 931. He wrote the treatises Rasaratnākara, Rasahṛdaya and Rasendra-maṅgala that deals with preparations of rasa (mercury) compounds.

It gives a survey of the status of metallurgy and alchemy in the land. Extraction of metals such as silver, gold, tin and copper from their ores and their purification were also mentioned in the treatise.

He also wrote Uttaratantra as a supplement to Suśruta Saṁhitā, dealing with preparation of medicinal drugs, and an Āyurvedic treatise, Ārogyamañjarī. His other treatises are Kakṣapuṭa-tantra, Yogasāra and Yogaśataka. Because of his profound scholarliness and versatile knowledge, he was also appointed as Chancellor of the famous University of Nalanda.

**Bhikṣu Nāgārjuna:** Bhikṣu Nāgārjuna (150-250 CE) was an important Buddhist teacher and philosopher. Along with his disciple Āryadeva, he is credited with founding the Madhyamaka school of Mahāyāna Buddhism. Nāgārjuna is credited with developing the philosophy of the Prajñāpāramitā Sūtras—even, in some sources, with having (re)revealed these scriptures in the world, having recovered them from the realm of the nāga-s (snake/dragon spirits) and is also sometimes associated with the Buddhist university of Nalanda.

Very little is reliably known of the life of Nāgārjuna, since the surviving accounts were written in Chinese and Tibetan, centuries after his death. According to some accounts, Nāgārjuna was originally from Southern India.

Some scholars believe that Nāgārjuna was an advisor to a king of the Sātavāhana Dynasty. Archaeological evidence at Amaravati indicates that if this is true, the king may have been Yajña Śrī Śātakarṇi, who ruled between 167 and 196 CE. On the basis of this association, Nāgārjuna is conventionally placed at around 150-250 CE.

Some sources claim that Nāgārjuna lived on the mountain of Śrīparvata in his later years, near the city that would later be called Nāgārjunakoṇḍā ("Hill of Nāgārjuna"). Nāgārjunakoṇḍā was located in what is now the Nalgonda/ Guntur district of Andhra Pradesh. The Caitika and Bahuśrutīya nikāyas are known to have had monasteries in Nāgārjunakoṇḍā.

### Lohasiddhi and Dehasiddhi:

With the advent of 'Rasaśāstra', its evolution was seen with two mottos. One was lohasiddhi, where the trial and error methods were carried out to convert lower metals into gold. This was based purely for commercial purposes.

Attaining 'dehasiddhi' through 'Rasaśāstra' had the motto of retaining good health and virility as long as possible. In this quest, many medications were formulated and put to test. Here many useful medicines were prepared, which were of great help to humans to maintain their good health.

### Concept of rasa rasāyana:

Use of the term 'rasa' and 'rasāyana' together is indicative of the fact that the 'rasauṣadhis' were prepared and consumed in the initial days (tantric period) only for 'rasāyana' (rejuvenation) effect.

Since, 'Rasaśāstra' originates from 'tantric cult', all the efforts put into the preparation of rasa medicines was either for rasāyana (rejuvenation) or for vājīkaraṇa (aphrodisiac effect).

However, the wide range of rasa medicines prepared now, are having wider therapeutic applicability. They are known for their faster action in smaller doses, quicker assimilation, excellent therapeutic values, longer shelf life and easy preservation.

### Significant books that have contributed in the development of 'Rasaśāstra':

| | Book | Author | Century |
|---|---|---|---|
| 1. | Yogaratnamālā | Siddha Nāgārjuna | Not clear |
| 2. | Rasārṇava | Bhairavanātha yogī | Not clear |
| 3. | Rasahṛdaya-tantra | Bhagavatpāda Govinda | 7th century |
| 4. | Gorakṣa Saṁhitā | Gorakhanātha | 12th century |
| 5. | Rasendra-cūḍāmaṇī | Somadeva | 12th century |
| 6. | Rasaprakāśa-sudhākara | Yaśodhara Bhaṭṭa | 12th century |
| 7. | Rasaratna-samuccaya | Siṁhagupta-putra Vāgbhaṭācārya | 13th century |
| 8. | Rasa-ratnākara | Nityānātha Ācārya | 13th century |
| 9. | Rasa-paddhati | Bindu Ācārya | 13th century |
| 10. | Śārṅgadhara Saṁhitā | Śārṅgadhara Ācārya | 14th century |
| 11. | Rasacintāmaṇi | Ānandadeva Sūri | 15th century |
| 12. | Rasendra-cintāmaṇī | Ḍhuṇḍhukanātha Ācārya | 15th century |

| | Book | Author | Century |
|---|---|---|---|
| 1. | Lohasarvasva | Sureśwara Ācārya | 15th century |
| 2. | Rasasāra | Govindācārya | 15th century |
| 3. | Rasendrasāra-saṅgraha | Gopālakṛṣṇa Bhaṭṭa | 16th century |
| 4. | Bhāvaprakāśa | Bhāvamiśra Ācārya | 16th century |
| 5. | Rasapradīpa | Prāṇanātha Ācārya | 16th century |
| 6. | Rasakoumudī | Candraśekhara Munīśwara | 16th century |
| 7. | Basavarājīyam | Basavarāju | 16th century |
| 8. | Rasakāmadhenu | Cūḍāmaṇi Miśra | 17th century |
| 9. | Bṛhat yogataraṅgiṇī and Yogataraṅgiṇī | Trimalla Bhaṭṭa | 17th century |
| 10. | Āyurveda-prakāśa | Mādhavācārya | 18th century |
| 11. | Yogaratnākara | Not clear | 18th century |
| 12. | Bhaiṣajyaratnāvalī | Govindadāsa Sena | 19th century |
| 13. | Bṛhadrasarāja-sundara | Dattarāma Coubey | 19th century |
| 14. | Rasataraṅgiṇī | Sadānanda Śarmā | 20th century |
| 15. | Rasajalanidhi | Bhūdeva Mukharjī | 20th century |
| 16. | History of Hindu Chemistry | P. C. Roy | 1904 |
| 17. | Rasendra Purāṇa | Rāmaprasāda Śarmā | 1916 |
| 18. | Rasayoga-sāgara | Vaidya Hariprapanna Śarmā | 1927-1930 |
| 19. | Āyurvedīya Khanija Vijñāna | Pratāpa Siṁha | 1931 |
| 20. | Siddhayoga Saṅgraha | Ācārya Yādavajī | 1943 |
| 21. | Bhasma Vijñāna | Hariśaraṇānanda | 1950 |
| 22. | Rasāmṛta | Ācārya Yādavajī | 1951 |
| 23. | Ānandakanda | Manthāna Bhairava | 1952 |
| 24. | Rasendra Sampradāya | Hajārīlāla Sukula | 1955 |
| 25. | Rasacikitsā | Prabhākara Caṭṭopādhyāya | 1956 |
| 26. | Rasa-mitra | Trayambakanātha Śarmā | 1965 |
| 27. | Pārada-vijñānīya | Vāsudeva Mūlaśaṅkara Dwivedī | 1969 |
| 28. | Ratna-vijñāna | Rādhākṛṣṇa Parāśara | 1972 |

**Advantages of 'Rasaśāstra':**

In the modern Āyurvedic practice the 'Rasaśāstra' has been considered more useful and effective when compared to the herbal preparations. It is said that the 'Rasaśāstra' has immense therapeutic applications some of which are prevention of ageing and reduction in age-related disorders.

Some other features that make 'Rasaśāstra' or rasa preparations more advantageous than the other preparations are:

1. It works in smaller doses and is faster in action, which makes it a therapy of choice.
2. The assimilation of rasa preparations in the body is much faster because the preparation undergoes different processes called saṁskāras. This helps in active and quick assimilation of even the minute doses in the body.
3. Incinerated minerals possess excellent therapeutic values and they have a longer shelf life.
4. The efficacy of the rasa preparations increases with time, which means that the rasa medicines have no expiry date.
5. It alleviates the need for tedious collection of herbs. Moreover, the minerals are perennially available when compared to herbs, which are mostly seasonal in nature.
6. The preservation is easy and less tedious.
7. The tastes of rasa medicines are generally neutral and are less cumbersome to administer.

**Significance of rasouaṣadhis:**

The following verses from different texts reveal the significance of 'Rasaśāstra'.

अल्पमात्रोपयोगित्वादरुचेर्प्रसङ्गतः । क्षिप्रमारोग्यदायित्वादौषधेभ्योऽधिको रसः ॥
(R. Sā. Saṅ. 1/4)

स्वल्पा हि मात्रा विपुला गुणाश्च सद्यो हि तद्दीपनपाचनाश्च ॥

The 'rasauṣadhis' are known for smaller dosage. They do not cause any nauseating sensation during consumption. These medicines provide quick results and they are useful in majority of difficult to cure disease conditions. These medicines are also good appetizers and digestives.

न रोगानां न दुष्यानां न च पुंसां परीक्षणम् । न देशस्य न कालस्य कार्ये रस चिकित्सते ॥
(B. R. Jvarādhikāra 5/469)

The verse quotes that, while using rasauṣadhis (rasa-cikitsā) the physician may give minimal attention towards the doṣa involvement (ekadoṣa, dwidoṣa and tridoṣa), disease condition (origin and the prognosis of disease condition), gender (male, female) of the patent, the place (jaṅgama, ānūpa and sādhāraṇa) and the kāla of treatment (season of disease origin and treatment).

Note: Though no treatment is possible without looking into all the factors mentioned above, the statement emphasize the fact that the rasauṣadhis are meant to accomplish the deficit components in the body. (E.g. loha bhasma in iron deficiency anemia; '*māṁsena māṁsavṛddhi*'; '*raktena raktavṛddhi*' etc) Than also this statement cannot be rationally substantiated. No treatment can be effectively administered without looking all the relevant and necessary factors of disease and the patient.

रूत्तमो रसवैद्यस्तु मध्यमो मूलिकादिभिः । अधमः शस्त्रदाहाभ्यामित्थं वैद्यास्त्रिधा मताः ॥

The physicians who treat the patients with 'rasauṣadhis' were considered 'uttama' vaidya. Those who treat with 'kāṣṭhouṣadha' are considered 'madhyama' and those who follow 'surgical procedures' were considered 'adhama' vaidya.

Note: This comparison was majorly drawn depending on the use of the medicines and the methods of treatment. This statement has no significance now.

❋

## Chapter 2

# RASAŚĀLĀ/BHEṢAJĀGĀRA

## (The Drug Manufacturing Unit)

Rasaśālā, bheṣajāgāra, auṣadha nirmāṇa kendra or pharmacy is always expected to be a quite hygienic and workable place with all facilities. We put up many rules and regulations for its establishment under the umbrella of Good Manufacturing Practice (GMP) now-a-days.

In the similar way our ancient ācāryas were much concerned about minutest parts of the bheṣajāgāra/rasaśālā. They concentrated not only on the construction of the manufacturing unit but also on the selection of place for construction, interior plans and arrangements, appointment of skilled attendants for different sections of pharmacy etc.

This chapter deals in brief about few of the classical references about the establishment of manufacturing unit.

**Selected area/interiors of Bheṣajāgāra/Rasaśāla:**

विमलोपवनप्रदेशगां रमणीयां जलयन्त्रशोभिताम् ।
कमनीय गवाक्षसंयुतां जनबाधारहितामसंकुलाम् ।।
निखिलौषध वर्गमण्डितां रससिद्धेश्वर चित्रभूषिताम् ।
विपुलाखिल साधनान्वितां रसशालां विदधीत शोभनाम् ।। (R. T. 1/13-14)

The rasaśālā (pharmaceutical unit for the preparation of 'rasauṣadhis') is constructed in a serene land. The term 'upavana pradeśa' indicates that the land selected for construction should be naturally beautiful with serene and healthy atmosphere and with good fertile soil to grow all the required herbal drugs.

The building should be well planned with suitably constructed and well ventilated wide rooms. The place of pharmacy building should be considerably far from the city and crowd.

The pharmacy should have different sections for all the activities carried out in the pharmacy. The raw drugs or the prepared medicines are to be neatly arranged with neat labels. The central hall of the pharmacy should have the photos of 'Lord Śiva', 'Ācārya Nāgārjuna' and other rasācārya.

The pharmacy and the surrounding area should be rich from greenery, water source and all the other pharmacy requirements to carry out the pharmaceutical preparations and its related works.

Note:

उपवनस्य औषधिसुलभताजनकत्वात्, रजोधूमादिबाधारहितत्वात् रम्यत्वाच्च । जनबाधारहिताम् + असङ्कुलां (असङ्कीर्णम्) । निखिलौषधवर्गेण, रसक्रियोपयोगिभेषजसमूहेन ।

(रससिद्धेश्वराः इति श्री शङ्करादयः)

- Another reference:

रसशालां प्रकुर्वीत सर्वबाधाविवर्जिते । सर्वौषधिमये देशे रम्ये कूपसमन्विते ।।
यक्षत्र्यक्षसहस्राक्षदिग्विभागे सुशोभने । नानोपकरणोपेतां प्राकारेण सुशोभिताम् ।। (R. R. S. 7/1-2)

## The plan of Bheṣajāgāra/Rasaśālā

शालायाः पूर्वदिग्भागे स्थापयेद् रसभैरवम् । वन्हिकर्माणि च आग्नेये याम्ये पाषाणकर्म च ।।
नैऋत्ये शस्त्रकर्माणि वारुणे क्षालनादिकम् । शोषणं वायुकोणे च वेधकर्म उत्तरे तथा ।।
स्थापनं सिद्धवस्तूनां प्रकुर्यादीशकोणके । पदार्थसंग्रहः कार्यो रससाधनहेतुकः ।।

(R. R. S. 7/3-5)

| | | | | |
|---|---|---|---|---|
| WEST-NORTH (Vāyavya) | | NORTH (Uttara) | | NORTH-EAST (Īśānya) |
| | Śoṣaṇa karma (Drying of raw drugs) | Vedha karma (Conversion of lower metals into gold) | Auṣadha saṅgrahaṇa (Storage of raw drugs & finished products) | |
| WEST (Paścima) (Vāruṇa) | Kṣālana karma | RASAŚĀLĀ | Rasabhairava (Statue of Lord Śiva) | EAST (Pūrva) |
| | Śastra karma (Cutting and slicing) | Pāṣāṇa karma (Pounding and grinding) | Agnisaṁskaraṇa (Boiling, frying, cooking etc) | |
| WEST-SOUTH (Nairṛtya) | | SOUTH (Dakṣiṇa) (Yāmya) | | SOUTH-EAST (Āgneya) |

Comment: Author here tries to put forward a better plan for suitable setup of the manufacturing unit. With time our ideas of convenience do change and they go hand in hand with the advancements of that particular era.

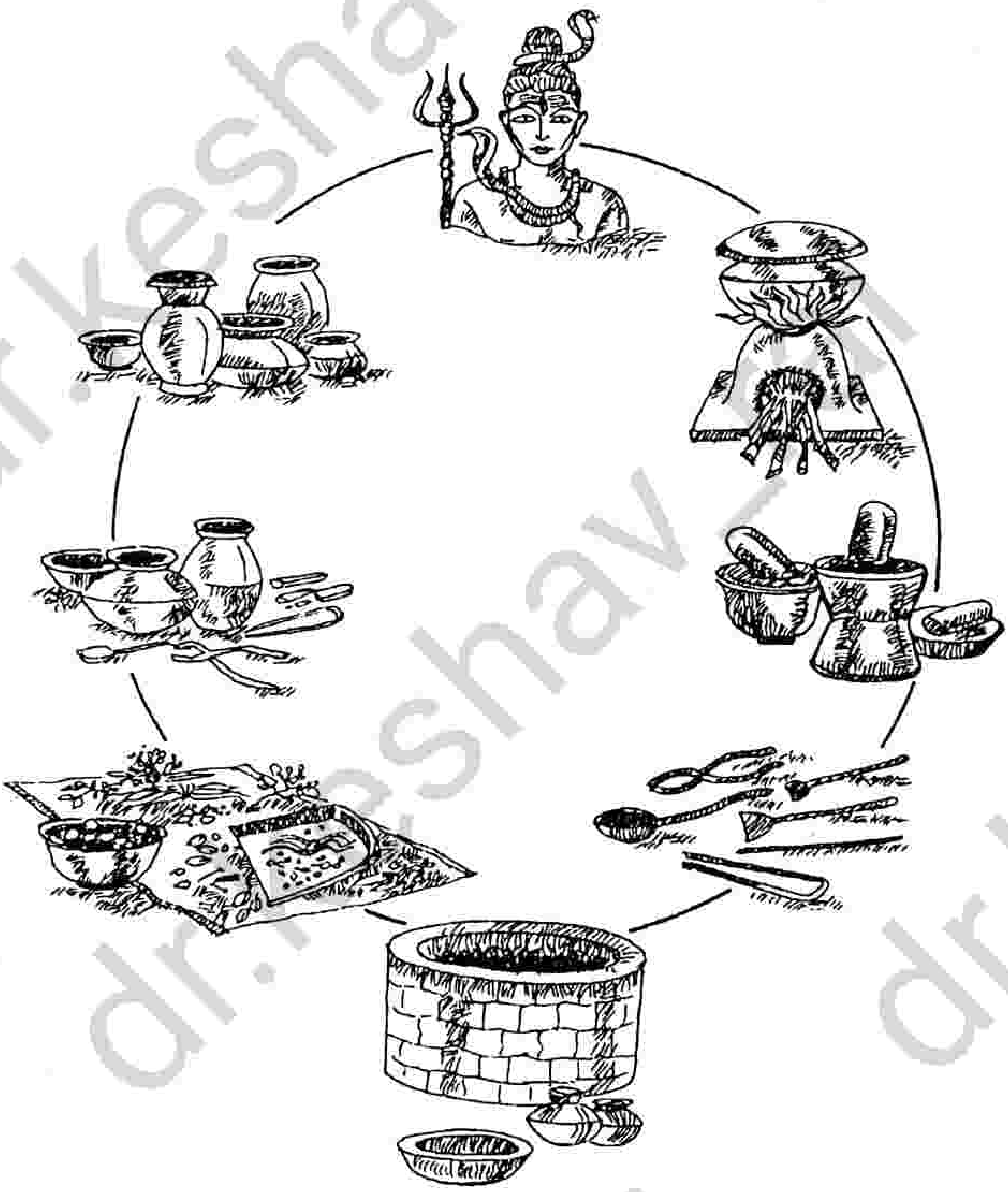
Moreover the setup of manufacturing units basically depend on the availability of place for the whole setup, amount of work carried out each day, use of machineries in the unit, water source available etc.

Now a days GMP (Good Manufacturing Practice) makes it mandatory to build manufacturing units as per its strict norms (refer the chapter GMP/Drugs and Cosmetics Act). Eventually it is all required to bring out the desired quality and standard in the products manufactured.

- Another reference:

> शङ्करं पूर्वदिग्भागे स्थापयेद्भिषजाग्रणी: । आग्नेये वह्निकार्याणि याम्ये प्रस्तरकृत्यकम् ।।
> शस्त्रकृत्यन्तु नैर्ऋत्ये क्षालनादीनि वारुणे । वायव्ये शोषणं शस्त्रमुत्तरे यन्त्ररक्षणम् ।।
> निदध्यादीशाकोणे तु रससाधनमूलकम् । मुख्योपकरणं तत्तन्नित्यकृत्यं समागतम् ।।

(R. T. 1/15-17)



Rasaśālā (Ancient Concept)

The traditional plan for 'rasaśālā' is as per below given points;

1. The statue of 'Lord Śiva' should be seated in pūrva (east) of the pharmacy building.

2. All the pharmaceutical works that need fire such as boiling, cooking, frying, incineration (agni-saṁskaraṇa) should be carried out in the room situated towards 'āgneya' (south-east) direction.
3. All the works done in 'khalva or ulūkhala yantra' (pāṣāṇa karma) such as pounding, grinding etc should be carried out in the room situated towards 'dakṣiṇa' (yāmya or south).
4. The works done with sharp instruments, such as cutting, slicing etc (śastra karma) should be done in the room situated towards 'nairṛtya' (south-west) direction.
5. All the works that involve washing with water (kṣālana karma) should be carried out in the room situated towards 'paścima' (vāruṇa or west).
6. The drying of the medicinal drugs (śoṣaṇa karma) should be done in the room situated towards 'vāyavya' (north-west) direction.
7. The preparation of all the 'yantra' (instruments) required in pharmacy should be done in the room situated towards 'uttara' (north).
8. All the requirements of 'pārada śodhana and māraṇa' should be placed in the room situated towards 'īśānya' (north-east) direction.

Note: All these arrangements are solely meant for 'the better handiness' and 'well organized work' while carrying out the pharmaceutical procedures.

**Rasaśālā- internal arrangements:** (R. T. 1/16-25)

The building of pharmacy should have, the following instruments and the required material to prepare these instruments whenever required. The pharmacy should have pestles and mortars made of stone and iron with different sizes and shapes (both round and oval). The glass bottles, mud pots, wooden drums, stainless steel containers should be present.

The sandaṁśa yantra, sharp instruments, ulūkhala yantra, sieves and crucibles should be present in many numbers. Dolāyantra and the instruments required to prepare the same time to time are most required. To keep the finished products safe, the pharmacy should have the suitable containers such as glass bottles and pet jars.

The balance, physical balance, all the raw drugs, dry cow dung cakes, wood, husk, grass, ash etc. depending on different seasons, the required materials and medicinal drugs are to be in stock in the pharmacy. The pharmacy building should be frequently cleaned and fumigated to prevent the infestation of the raw drugs and finished medicinal products.

### Rasaśāstrācārya swarūpa (Ideal teacher):

सदाचारः सुचरितः समदर्शी सदाशयः । सत्यवादी सिद्धमन्त्रः सर्वदा शङ्करप्रियः ॥
धीरो वीरः स्थिरप्रज्ञो रसकर्मविचक्षणः । रसतन्त्रस्वतन्त्रो यः स आचार्यः प्रशस्यते ॥
(R. T. 1/33-34)

The ideal teacher who teaches the theoretical and practical aspects of 'Rasaśāstra' should have good conduct, good track record, non-partial and a person of noble intentions. He should be truth speaking, highly proficient and God loving.

He is expected to be courageous, valorous, and stable minded and deeply experienced in the practical aspects of 'Rasaśāstra'. He should be capable enough to incorporate the scientific ideas into the subject and develop his own theoretical and practical theories for the benefit of the field. He should boldly deny the superstitious believes attached with this science and propagate only the scientific theories in this subject.

- Another reference:

आचार्यो ज्ञानवान्दक्षो रसशास्त्रविशारदः । मन्त्रसिद्धो महावीरो निश्चलः शिववत्सलः ॥
देवीभक्तः सदा धीरो देवतायागतत्परः । सर्वाम्नायविशेषज्ञः कुशलो रसकर्मणि ।
एवं लक्षणसंयुक्तो रसविद्यागुरुर्भवेत् ॥ (R. R. S. 6/3-4)

### Śiṣya swarūpa (Ideal student):

सदाशयः सदाचारः स्वकुलाचारदीक्षितः । गुरुपूजारतो वीरः सत्यवादी दृढव्रतः ॥
आज्ञापरो निरालस्यो कुलीनोऽतिविचक्षणः । आयुर्वेदकृताभ्यासः शिष्यः खलु प्रशस्यते ॥
(R. T. 1/35-36)

The student who studies 'Rasaśāstra' should have noble intentions, good nature and should rationally understand the nature of his work. He should be sincere to the teachers and the science, brave, truthful and hard working. He is expected to be obedient, active, noble and intelligent. The one who has all these characters is an ideal student of 'Rasaśāstra'.

- Another reference:

गुरुभक्ताः सदाचाराः सत्यवन्तो दृढव्रताः । निरालस्याः स्वधर्मज्ञाः सदाऽऽज्ञापरिपालकाः ॥
दम्भमात्सर्यनिर्मुक्ताः कुलाऽऽचारेषु दीक्षिताः । अत्यन्तसाधकाः शान्ता मन्त्राऽऽराधनतत्पराः ॥
इत्येवं लक्षणैर्युक्ताः शिष्याः स्युः सूतसिद्धये ॥ (R. R. S. 6/5-6)

### Varjya śiṣya:

दुराचारा दुश्चरिता अकुलीन महोद्धताः । चौर्यच्छलादिना नित्यं विद्याग्रहणलोलुपाः ॥
अज्ञातकुलशीला ये नास्तिका गुरुनिन्दकाः । शिष्योपनयने हेया नरा रसविशारदैः ॥
(R. T. 1/37-38)

The student who is wicked with unimpressive track-record, who do not have any noble intentions, who is disobedient and who tries to attain the knowledge through foul means, whose nature and background is obscure, who is atheist and who blames his teachers; such a student should not be accepted by the teachers to study this noble science.

- Another reference:

नास्तिका ये दुराचाराश्चुम्बका गुरुतोऽपरात् । विद्यां ग्रहीतुमिच्छन्ति चौर्यच्छद्मखलोत्सवात् ।।
न तेषां सिध्यते किञ्चिन्मणिमन्त्रौषधादिकम् । कुर्वन्ति यदि मोहेन नाशयन्ति स्वकं धनम् ।।
इह लोके सुखं नास्ति परलोके तथैव च ।।
(R. R. S. 6/8-9)

**Yogya paricāraka lakṣaṇa (Ideal attendant):**

सोद्यमाः सत्यवक्तारो निर्लोभाः शुचयः परम् । शूराः पथ्याशिनो ग्राह्याः भिषग्भिः परिचारकाः ।।
(R. T. 1/28)

The attendants in 'rasaśāla' should be hard working, truthful, generous, hygienic, physically strong and capable enough to understand all his responsibilities.

- Another reference:

सोद्यमाः शुचयः शूरा बलिष्ठाः परिचारकाः ।।
(R. R. S. 7/26)

1. The assistants in the manufacturing units should be clean from the hygienic point of view.
2. He should be brave enough to carry out the given work efficiently.
3. He is expected to be physically strong to endure the heavy work load of the unit.

**Pākakarmaghna:**

शुचीनां सत्यवाक्यानां आस्तिकानां मनस्विनाम् । सन्देहोज्झितचित्तानां रसः सिद्ध्यति सर्वदा ।।
(R. R. S. 7/35)

1. The assistant of pāka śālā should be first and foremost hygienic and should understand the essentiality of hygiene at pāka śālā.
2. He should be a truth speaking person.
3. He should be the person who believes in the existence of God.
4. He should have full control over his mind.
5. He is also expected not to have any doubts regarding the manufacturing work assigned to him. In other words he should be expert in the work and moreover quick lerner.

dr_keshav_raj

### Drug keeper:

ततद् औषधनामज्ञाः शुचयो वञ्चनोज्झिताः । नानाविषयभाषाज्ञास्ते मता भेषजाहृतौ ।।

(R. R. S. 7/34)

1. Persons with adequate experience to know the names of the raw drugs and furnished products are to be appointed for this work.
2. Appointed person should be clean and good natured.
3. He should have good general knowledge.
4. He is supposed to know many languages for better interaction with the customers. Such a person suits well for drug keeper job.

### Storage of raw materials:

The drug storage techniques are to be followed with utmost care and intelligence as the potency of the raw drugs has to be retained until the stored drug goes into a preparation. For this our classics also have emphasized the fact of proper storage of drug materials and the store house.

As per Suśruta the methods of drug storage are said as below;

प्लोतमृद्भाण्डफलकशङ्कुविन्यस्त भेषजम् । प्रशस्तायां दिशि शुचौ भेषजागारमिष्यते ।।

(S. S. Sū. 36/18)

The raw drugs required for the preparation of medicines are to be stored in cloth, mud pots over the planks/wooden benches (phalaka), drugs hanged in cloths/gunny bags or specially designed hangars to the roof of the store house or to the nails (śaṅku) fixed in the walls of the walls. East or north direction of the storehouse is preferred for storing the drugs.

### Plan of modern pharmacies:

The plans of each pharmacy solely depends on the place available for the construction of building and the scale of production (small, medium and large scale production).

The below given plan includes all the essential sections to be considered before preparing the plan for the pharmacy building.

### Ideal plan for construction of pharmacy:

A mediocre manufacturing unit will have all the compartments mentioned below. (Next page)

<table>
<tr><td colspan="2">Raw drug receiving and storage</td><td>Washing and soaking section</td><td>Drying of raw drugs</td><td>Wash and change room for workers</td></tr>
<tr><td>Filling and bottling section</td><td>Research and Development (R & D) section</td><td>Conference hall</td><td>Fermentation section</td><td>Pounding and pulverization</td></tr>
<tr><td colspan="5">PASSAGEWAY</td></tr>
<tr><td colspan="2">Packaging and Labeling</td><td>Statue of Lord Śiva</td><td colspan="2" rowspan="2">Manufacturing unit</td></tr>
<tr><td colspan="2">Storage of the finished products</td><td rowspan="2">**ENTRANCE**</td></tr>
<tr><td colspan="2">Dispensing section</td><td colspan="2">Administrative block and Office</td></tr>
</table>

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## Chapter 3

# PARIBHĀṢĀ PRAKARAṆA

## (Significant Definitions)

### Paribhāṣā- definition:

निगूढानुक्तलेशोक्तसन्दिग्धार्थप्रदीपिका । सुनिश्चितार्था विबुधैः परिभाषा निगद्यते ।।

(R. T. 2/2)

The paribhāṣā is a statement that gives a clear and distinct meaning of a word or an expression. It clarifies the concealed (nigūḍha), omitted (anukta), unclear (leśokta) and mystifying (sandigdhārtha) meanings of a word or a verse in the classics.

### Paribhāṣā- significance and essentiality:

परिभाषाध्यायमादौ योऽधीते रससाधकः । रसतन्त्रार्थविज्ञाने न स मुह्यति कुत्रचित् ।।

(R. T. 2/1)

The person who masters the 'paribhāṣā prakaraṇa' (definitions) of 'Rasaśāstra' before going deep into the science, he confronts no difficulties in understanding the nitty-gritty's of this subject. Therefore, the knowledge of 'paribhāṣā prakaraṇa' is most essential and equally significant.

### 1. Āvāpa or Pratīvāpa:

द्रव्यान्तरविनिक्षेपो द्रुते वङ्गादिके तु यः । क्रियते स प्रतीवाप आवापश्च निगद्यते ।।

(R. T. 2/39)

- Another reference:

द्रुते द्रव्यान्तरक्षेपो लोहाद्ये क्रियते हि यः । स आवापः प्रतीवापस्तदेवाऽऽच्छादनं मतम् ।।

(R. R. S. 8/54)

The procedure of adding selected dravya into any of the molten metals (nāga, vaṅga etc) during the specific pharmaceutical procedures is called as 'āvāpa' or 'pratīvāpa'.

Example: In 'vaṅga jāraṇa' and 'nāga jāraṇa', the 'molten vaṅga (tin)' or 'molten nāga (lead)' are added with the rough powder of 'apāmārga' or 'pippalī' twak. This process is the example of 'āvāpa' or 'prativāpa' procedure.

### 2. Nirvāpa:

धात्वादेर्वह्नितप्तस्य जलादौ यन्निषेचनम् । स निर्वापः स्मृतश्चापि निषेकः स्नपनञ्च तत् ।।

(R. T. 2/40)

• Another reference:

तप्तस्याप्सु विनिक्षेपो निर्वापः स्नपनञ्च तत् । प्रतीवापादिकं कार्यं द्रुते लोहे सुनिर्मले ।।

(R. R. S. 8/56-57)

The procedure of heating the selected metals red hot and dipping them in any of the liquids such as water, buttermilk, milk, decoction, fermented liquids etc is called as nirvāpa. It is also called as 'niṣeka'and 'snapana'.

Example: During 'Abhraka śodhana', the 'abhraka patra' are heated red hot and dipped for 7 times in 'kāñjī', 'gomūtra', 'triphalā kwātha' or 'godugdha'. Similar 'heating and dipping' procedure is followed in Rajata śodhana, Loha śodhana, Tāmra śodhana etc.

### 3. Ḍhālana:

संद्रावितस्य द्रव्यस्य द्रवे निक्षेपणन्तु यत् । ढालनं तत्समुद्दिष्टं रसकर्मविशारदैः ।। (R. T. 2/36)

• Another reference:

द्रुतद्रव्यस्य निक्षेपो द्रवे तद् ढालनं मतम् ।। (R. R. S. 8/43)

The procedure of adding any molten metal (gold, silver etc) into a vessel containing any of the liquid or liquid preparations such as cūrṇodaka, swarasa, kwātha etc is called as ḍhālana.

Example: During 'Nāga śodhana', 'Vaṅga śodhana' or 'Yaśada śodhana', the molten lead, tin or zinc are poured into a vessel containing 'lime water' (cūrṇodaka) or 'nirguṇḍī swarasa + haridrā cūrṇa' or in 'arka dugdha' for 7 times.

### 4. Bhāvanā:

यच्चूर्णितस्य धात्वादेर्द्रवैः सम्पेष्य शोषणम् । भावनं तन्मतं विज्ञैर्भावना च निगद्यते ।। (R. T. 2/49)

The process of triturating the fine powder/powders of any drug material in a clean khalva yantra, by adding any specified liquid, enough only to soak the drug. The trituration should be continued until the soaked wet powder becomes dry again. This entire procedure is called as one bhāvanā or bhāvana.

Example: During the preparation of 'Tribhuvana kīrti rasa', the fine powder of all the ingredients are subjected for 7 bhāvanās each with 'tulasī swarasa', 'ārdraka swarasa' and 'dhattūra swarasa'.This 'bhāvanā' procedure is adopted in majority of 'khalvīya rasāyana'.

**Bhāvanā- the liquid quantity:**

> द्रवेण यावता द्रव्यं चूर्णितं त्वार्द्रतां व्रजेत् । तावानेव द्रवो देयो भिषग्भिर्भावनाविधौ ।।
> भाव्यद्रव्यमितः क्वाथ्यो जलमष्टगुणं ततः । वस्वंशशोषितः क्वाथो देयः क्वाथेन भावने ।।

(R. T. 2/50-51)

In a bhāvanā, only required quantity of liquid that is enough to completely soak the fine powder of the drug/drugs is added and triturated until the powder becomes dry. If any decoction is specified as bhāvanā dravya, the kwātha has to be prepared by taking coarse powder of the kwātha dravya equal to that of bhāvanā dravya (dry powder).

The kwātha dravya is taken in a clean decoction vessel along with 8 times of water. The vessel is placed over mild fire and boiled until the liquid is reduced to 1/8th. Later the reduced liquid is filtered through a cloth and the filtrate is used as decoction for the purpose of bhāvanā.

### 5. Jāraṇā saṁskāra:

> सूते गन्धादिनिक्षेपात्तत्तद्विधिविशेषतः । गन्धाद्यं जार्यते यत्तु जारणं तदिहोच्यते ।। (R. T. 5/100)

- Other reference:

> द्रुतग्रासपरिणामो विडयन्त्रादियोगतः । जारणेत्युच्यते तस्याः प्रकाराः सन्ति कोटिशः ।।

(R. R. S. 8/85)

The pharmaceutical procedure that enables the pārada to digest gandhaka and other metals and minerals in it; is known as 'jāraṇa saṁskāra'. Here the term 'jāraṇa' means 'jīrṇana' (digestion) and it refers to the digestion of metals and minerals by mercury.

To imbibe the power of digestion (jāraṇa śakti) in mercury, one needs to process it with specified pharmaceutical procedures (*tattadvidhi-viśeṣa*). The pharmaceutical procedures include, swedana, mardana, application of puṭa etc, which may be accomplished by using some of the useful instruments, like 'vālukā yantra', 'kacchapa yantra', 'jāraṇa yantra' etc. There will be innumerable types of 'jāraṇa'.

### 6. Mūrcchanā- definition:

> तत्तद्विधिप्रभेदेन रसस्याव्यभिचारतः । व्याधिघातकता या स्यात् सा मता मूर्च्छना बुधैः ।।

(R. T. 6/1)

The act of imbibing definite therapeutic properties (vyādhighātaka śakti) in purified mercury used in any of the compound formulation (with or without sulphur), through various pharmaceutical procedures is known as mūrcchanā.

### 7. Śodhana:

उद्दिष्टैरौषधैः सार्द्धं क्रियते पेषणादिकम् । मलविच्छित्तये यत्तु शोधनं तदिहोच्यते ॥ (R. T. 2/52)

All the pharmaceutical procedures such as washing (kṣālana), trituration (mardana/bhāvanā), heating and dipping (nirvāpaṇa) etc carried out over a medicinal drug with the intention of getting it purified is called as śodhana.

The process of śodhana includes both physical as well as chemical purification of the drug.

### 8. Māraṇa:

शोधितान् लोहधात्वादीं विमर्द्य स्वरसादिभीः । अग्निसंयोगतो भस्मीकरणं मारणं स्मृतम् ॥

The process of subjecting the metallic and mineral drugs for different pharmaceutical procedures using wide range of herbal formulation (swarasa, kwātha etc) and later subjecting them to intense heat to obtain them in the form of bhasma is called as māraṇa (incineration).

म्रीयते अनेन इति मारणम् ।

The literal meaning of the term 'māraṇa' is 'to kill'. The process of killing of any metallic drug to make it fit for internal administration is called as māraṇa or incineration. Here the drug particles become so fine that, they are rendered fit for absorption by living body tissue.

मृतानिलोहानि रसीभवन्ति ।

Through 'māraṇa', the incinerated metals and minerals are converted into 'rasībhava state' (organo-metallic compound form or the form in which, they are absorbed by the living body cells).

### 9. Amṛtikaraṇa:

लोहादीनां मृतानां वै शिष्टदोषापनुत्तये । क्रियते यस्तु संस्कार अमृतीकरणं मतम् ॥ (R. T. 2/58)

The special pharmaceutical procedures (saṁskāra) carried out to eliminate the remaining doṣas of any 'dhātu bhasma' (incinerated metal) is called as 'amṛtīkaraṇa'.

अरुणभस्मनस्तु पुनरमृतीकरणेन गुणवृद्धिर्वर्णहानिश्च भवति । (Āy. Pra. 1/135)

Amṛtīkaraṇa enhances the properties (guṇa vṛddhi) of the bhasma and causes depletion in its colour.

### 10. Lohitīkaraṇa:

The pharmaceutical procedures carried out on prepared 'bhasma' to induce 'rakta varṇa' (red colour) in it is called as 'lohitīkaraṇa'.

Example: 'Abhraka bhasma lohitīkaraṇa' (R. T. 10/65-67; find below in the relevant chapter).

### 11. Mṛta-loha:

मृतं लोहं पुटे ध्मातं ताराज्यमधुसंयुतम् । न त्यजेत्तारमानं वा मृत-लोहं तदुच्यते ।। (R. T. 2/55)

The 'mṛta loha' or 'mṛta lohatwa' is a test done to confirm the perfectness of any of the 'incinerated metals' (dhātu bhasma).

Incinerated metal/mineral is added with equal quantities of silver (tāra), ghee (ājya), honey (madhu). All these drugs are enclosed in an appropriate crucible and subjected to suitable puta. If the quantity of silver remains unaltered, the mṛtalohatwa of bhasma stands vindicated.

Example: All bhasma of metal and mineral are suitable for 'Mṛta-loha bhasma parīkṣā'.

### 12. Sattvapātana:

क्षाराम्लद्रावकैर्युक्तं ध्मातमाकरकोष्ठके । यस्ततो निर्गतः सारः सत्त्वमित्यभिधीयते ।। (R. Cū. 4/38)

Any of the selected 'dhātu' is triturated with required quantity of 'kṣāra dravya', 'amla dravya' or 'drāvaka-varga dravya'.

The mixture is made into a bolus, dried, enclosed in suitable sized 'mūṣā' and subjected for heat in 'sattvapātana koṣṭhī'. Thus, sattva or the essence of 'dhātu dravya' can be extracted.

The process of 'sattva' extraction from any of the 'dhātu dravya' through various pharmaceutical procedures is the called as sattvapātana.

Example: Abhraka sattva is aluminum (Al); Sattva of 'capala' is 'selenium' (Se); Haratāla sattva is 'arsenic'; Mayūrapiccha and bhūnāga sattvapātana yields copper.

### 13. Śuddhāvarta:

यदा तु ज्वलनो ज्वालाकुलः शुक्लसमुत्थितिः । सत्त्वनिर्गमकालः स शुद्धावर्त इति स्मृतः ।।
(R. T. 2/41)

• Another reference:

यदा हुताशो दीप्तार्चिः शुक्लोत्थानसमन्वितः । शुद्धावर्तस्तदा ज्ञेयः स कालः सत्त्वनिर्गमे ।।
(R. R. S. 8/58)

Whenever any purified metal or mineral is placed in a crucible and subjected for intense heat in an oven (bhaṭṭī) with the intention of 'sattva' extraction, the fire flames at a particular stage turn white in colour. These white flames are for intense heat in an oven (bhaṭṭī) with the intention of 'sattva' extraction, the fire flames at a particular stage turn white in colour. These white flames are called as 'śuddhāvarta'. This stage is indicative of sattva getting collected separately.

### 14. Bījāvarta:

द्राव्यद्रव्यनिभा ज्वाला दृश्यते धमने यदा । द्रावस्योन्मुखता सेयं बीजावर्तः स उच्यते ॥

(R. R. S. 8/59)

Whenever any metal or mineral is placed in a crucible and subjected for intense heat in an oven (bhaṭṭī) with the intention of melting it, the shades of the melting metal's colour is seen in the fire flames at a particular stage.

This particular stage of visualizing the shades of metal's or mineral's colour in the fire flames is called as 'bījāvarta'. This stage indicates about the metal or mineral reaching its melting point.

### 15. Druti:

औषधाध्मानयोगेन लोहधात्वादिकं तथा । सन्तिष्ठते द्रवाकारं सा द्रुतिः परिकीर्तिता ॥

(R. R. S. 8/84)

Whenever any metal (iron, gold, silver etc) is subjected for intense heat along with few other selected 'medicinal drugs' (auṣadha dravya), the molten metal tends to remain in liquid molten state only. This molten liquid metal is called as the 'druti' of that particular metal.

### Druti lakṣaṇa:

निर्लेपत्वं द्रुतत्वं च तेजस्त्वं लघुता तथा । असंयोगश्च सूतेन पञ्चधा द्रुतिलक्षणम् ॥

(R. R. S. 8/83)

1. Nirlepatwa (non sticky) 2. Drutatva (remain in liquid state) 3. Tejastva (lustrous) 4. Laghutva (lighter than original metal/mineral) and 5. Asm̐yoga sūta (remain immiscible with mercury); these are the five symptoms of 'druti'.

### 16. Rudra bhāga:

भैषज्यक्रीणितद्रव्यभागोऽप्येकादशो हि यः । वणिग्भ्यो गृह्यते वैद्यै रुद्रभागः स उच्यते ॥

(R. R. S. 8/3)

In all the medicines bought from a 'medicine seller' either by the patients or the physician himself, the 1/11th part of the medicine's value (in money) was paid by the 'medicine seller' to the 'vaidya' (physician). This share of money paid to the physician by the medicine seller was called as the 'rudra bhāga'.

### 17. Dhanvantari bhāga:

अर्धं सिद्धरसस्य तैलघृतयोर्लेहस्य भागेऽष्टमः संसिद्धाखिललोहचूर्णवटकादीनां तथा सप्तमः ।
यो दीयेत भिषग्वराय गदिभिर्निर्दिश्य धन्वन्तरिम् सर्वाऽऽरोग्यसुखाप्तये निगदितो भागः स धन्वन्तरेः ॥
(R. R. S. 8/2)

The share of medicine that the physician used to get in olden days as a reward for his efforts in preparing the suitable medicine for the patient at the patient's expenses is called as 'dhanvantari bhāga'.

After preparation of the medicine, the patient or the patient party used to offer a share of the same medicine to the physician with the intention to please him and to regain good health in the name of Lord Dhanvantari. The percentage of share used to differ for different dosage forms as shown below;

| Dosage form | Offered physician's share |
|---|---|
| Rasouṣadhis, medicated ghee and medicated oil | Half part |
| Avaleha | 1/8th part |
| Dhātu bhasma, cūrṇa, vaṭī, guṭikā, modaka, āsavāriṣṭa etc | 1/7th part |

### 18. Viśwāsaghātaka vaidya:

भागाद्धन्वन्तरेर्लोभादधिकं यो हरेद्भिषक् । दद्याच्च भेषजं दुष्टं स वै विश्वासघातकः ॥
(R. T. 2/73)

The physicians who demand more percentage of 'dhanvantarī bhāga' or the physicians who prepare cheaper medicine and claim higher prices from the patients are considered a cheat (quack) or viśwāsaghātaka vaidya.

### 19. Apunarbhava bhasma parīkṣā:

समित्रञ्चकं ध्मातं प्रकृतिं नैति यत् पुनः । अपुनर्भवमुक्तं तन्निरुत्थं च तदीरितम् ॥ (R. T. 2/56)
गुडगुञ्जासुखस्पर्शमध्वाज्यैः सह योजितम् । नायाति प्रकृतिं ध्मानादपुनर्भवमुच्यते ॥
(R. R. S. 8/29)

To perform 'apunarbhava bhasma parīkṣā', any of the 'dhātu bhasma' is triturated with equal quantity of 'mitra pañcaka' varga dravya and the mixture is taken in a crucible.

It is subjected for intense heat with a suitable puṭa. Even after application of intense heat, if no changes are seen in the quantity and quality of the bhasma, it is indicative of bhasma 'apunarbhavatwa'.

Example: Swarṇa bhasma, Rajata bhasma, Tāmra bhasma, Loha bhasma etc.

### 20. Niruttha bhasma parikṣā:

अपुनर्भवसंज्ञं यल्लोहे तारसमन्वितम् । यदा तारे न लगति तन्निरुत्थमिहोच्यते ।। (R. T. 2/57)

To perform 'niruttha bhasma parīkṣā', any of the 'dhātu bhasma' is taken in a crucible along with equal quantity of 'silver' (tāra or rajata) and subjected for intense heat in a suitable puṭa. Even after application of intense heat, if the bhasma does not adhere to the silver, it is indicative of bhasma 'nirutthatwa'.

Rationality: Here if any free metal portion is left out in the 'bhasma', it adheres to the 'silver' as the silver is having high affinity towards metals. Example: Abhraka bhasma, Tāmra bhasma etc;

### 21. Rekhāpūrṇatwa:

अङ्गुष्ठतर्जनीघृष्टं यत्तद्रेखान्तरे विशेत् । मृतलोहं तदुद्दिष्टं रेखापूर्णाभिधानतः ।। (R. R. S. 8/27)
रेखाभिः पूर्णम् अङ्गुष्ठ-तर्जनीभ्यां मृष्टे सति तयोः रेखान्तरे यद्विशति तद् ।
(Āyurvedīya Śabdakośa)

It is a test to ascertain the fineness of the prepared dhātu-bhasma. Here a pinch of bhasma is rubbed in between the thumb and the index finger. If the bhasma enters and embeds into the finger prints, it indicates rekhāpūrṇatwa, sucha a bhasma is considered enough fine and accepted as standard.

### 22. Vārītara bhasma parikṣā:

मृतं तरति यत्तोये लोहं वारितरं हि तत् ।। (R. R. S. 8/27)
मृतं लोहं विनिक्षिप्तं यदा तरति वारिणि । रसतन्त्रसुनिष्णातैस्तद् वारितरमीरितम् ।। (R. T. 2/53)

If a pinch of properly incinerated metallic bhasma is put over the stable water in a bowl, the bhasma should float on the water but not sink. This indicates the 'vārītaratwa' of the dhātu bhasma. Here the incinerated metallic bhasma will be so fine that, it fails to even break the surface tension of the water.

Example: Abhraka bhasma, haratāla bhasma, loha bhasma etc; all bhaśmas of metal and mineral except the bhasmas of 'sudhā varga dravya' are suitable for 'vārītara bhasma parīkṣā'.

### 23. Kajjalī:

धातुभिर्गन्धकाद्यैश्च निर्द्रवैर्मर्दितो रसः । सुश्लक्षणः कज्जलाभोऽसौ कज्जलीत्यभिधीयते ।।
(R. R. S. 8/5)

- Another reference:

निर्द्रवैर्धातुभिश्चाथ गन्धादिभिः पेषितः पारदः श्लक्ष्णतां प्रापितः ।
कज्जलाभो यदा जायतेऽसौ तदा नामतः कोविदैः कज्जलीत्युच्यते ।। (R. T. 2/27)

Śuddha 'pārada' is taken in a clean khalva yantra along with desired ratio of 'śuddha gandhaka' or any purified rasa dravya or dhātu bhasma and triturated thoroughly 'without adding any liquids' (water, swarasa, kwātha etc) to obtain the mixture in jet-black coloured fine powder form. This black coloured powder with no shiny particles in it is called as 'kajjalī'.

### 24. Rasapaṅka:

सद्रवैर्गन्धकाद्यैश्च धातुभिः पेषितो रसः । सुश्लक्ष्णः पङ्कसङ्काशो रसपङ्क इति स्मृतः ॥
(R. T. 2/29)

- Another reference:

सद्रवा मर्दिता सैव रसपङ्क इति स्मृता ॥ (R. R. S. 8/6)

Śuddha 'pārada' is taken in a clean khalva yantra along with desired ratio of 'śuddha gandhaka' or any purified rasa dravya or dhātu bhasma and triturated thoroughly with any of the liquids (water, swarasa, kwātha etc) in required quantity to obtain the mixture in thick swamp like consistency (paṅkavat). This 'paṅkavat' (swamp like) mixture obtained at the end is called as 'rasapaṅka'.

Note: As per practical experience, the liquid should be added only after preparation of proper 'kajjalī' and triturated further to obtain 'rasapaṅka'. If the liquid is added to the mixture at the beginning, it is difficult to attain the correct 'rasapaṅka' consistency.

### 25. Rasapiṣṭi:

सूतं विमर्द्य गन्धेन दुग्धाद्यैस्तु द्रवैस्तथा । पेषणात् पिष्टतां नीता मता पिष्टी च पिष्टिका ॥
(R. T. 2/30)

- Another reference:

खल्ले विमर्द्य गन्धेन दुग्धेन सह पारदम् । पेषणात्पिष्टतां याति सा पिष्टीति मता परैः ॥
(R. R. S. 8/8)

Śuddha 'pārada' is rigorously triturated with 'śuddha gandhaka' in desired quantity along with milk (godugdha) in required quantity. The trituration is continued until the mixture attains thick wet flour like consistency (piṣṭi). This paste like product obtained at the end of trituration is called as 'rasa piṣṭi' or 'pārada piṣṭi'.

**Rasapaṅka and Rasapiṣṭi- difference:**

| Rasapaṅka | Rasapiṣṭi |
|---|---|
| 1. Śuddha 'pārada' is triturated with 'śuddha gandhaka' + any of the purified rasa dravya or any of the dhātu bhasmas to prepare kajjalī. | 1. Here śuddha 'pārada' is triturated with 'śuddha gandhaka' alone to prepare kajjalī. |
| 2. The kajjalī is triturated again along with any of the liquids in required quantity except milk. | 2. Here the kajjalī is triturated along with milk (godugdha) in required quantity. |
| 3. The trituration is continued until the mixture attains thick swamp like consistency (paṅkavat). | 3. The trituration is carried out until the mixture attains thick wet flour like consistency (piṣṭi). |

### 26. Naṣṭapiṣṭa lakṣaṇa:

स्वरूपस्य विनाशेन पिष्टत्वाद्बन्धनं हि तत् । विद्वद्भिर्निर्जितः सूतो नष्टपिष्टः स उच्यते ।।

(R. R. S. 8/66)

Eradicating the original form of 'mercury' and bringing it in the form of kalka is 'naṣṭapiṣṭatwa' (eminent people in the field call so). Here the 'capalatwa' and 'cañcalatwa'—the natural properties of mercury are eradicated by subjecting it to the different pharmaceutical procedures like swedana and mardana.

### 27. Swāṅga-śīta:

ज्वलनस्थितमेवेह शीतलत्वमुपैति यत् । स्वाङ्गशीतं तदुद्दिष्टं स्वतःशीतञ्च तन्मतम् ।।

(R. T. 2/47)

After subjecting any 'samputita dravya' for suitable puṭa (heat), the stage where all the heat subsides on its own and the drug is collected, is called as 'swāṅgaśīta' stage. It is also called as 'swataḥ śīta'. Example: All 'puṭa' applied in conventional method including kūpīpakwa rasāyana.

Note: The significance of this definition is, after application of any puṭa, the drug material should be allowed to cool down on its own within the enclosed sampuṭa without extinguishing the 'agni'. Nothing should be done to cool the drug in a shorter period.

### 28. Bahiḥ-śīta:

वह्नेर्बहिः समानीय यद् द्रव्यं याति शीतताम् । बहिःशीतं तदुद्दिष्टं बाह्यशीतञ्च तन्मतम् ।।

(R. T. 2/48)

- Another reference:

वह्निस्थमेव शीतं यत्तदुक्तं स्वाङ्गशीतलम् । अग्नेराकृष्य शीतं यत्तद्बहिःशीतमुच्यते ।।
(R. R. S. 8/60-61)

During any of the pharmaceutical procedures, the heated 'auṣadha dravya' is soon taken out from fire and allowed to cool on its own (*agnerākṛṣta śītam bahiḥśītam*), the procedure will be called as '**bahiḥśīta**' or '**bāhyaśīta**'.

Example: Bahiḥ-śīta is seen in all types of pharmaceutical procedures followed in 'Bhaiṣajya Kalpanā'.

**29. Drāvaka gaṇa:**

गुञ्जा मधु गुडः सर्पिः सौभाग्यं गुग्गुलुस्तथा । पूर्वाचार्यैः कीर्तितोऽयं धातूनां द्रावको गणः ।।
(R. T. 2/35)

1. Guñjā (Abrus precatorius) 2. Madhu (honey) 3. Guḍa (jaggary) 4. Sarpiḥ (ghee) 5. Ṭaṅkaṇa (Borax) and 6. Guggulu (Commiphora mukul); the group of all these drugs are together branded as 'dhātu-drāvaka gaṇa'. This set of drugs is used in many pharmaceutical procedures.

**30. Mitra-pañcaka:**

आज्यं गुञ्जाथ सौभाग्यं क्षौद्रं च पुरसंज्ञकम् । एतत्तु मिलितं विज्ञैर्मित्रपञ्चकमुच्यते ।।
विविधानां तु लोहानां द्रावणाय विशेषतः । रसतन्त्रविशेषज्ञैर्युज्यते मित्रपञ्चकम् ।।
(R. T. 2/37-38)

1. Ājya (ghee) 2. Guñjā (Abrus precatorius) 3. Ṭaṅkaṇa (soubhāgya; borax) 4. Kṣoudra (madhu; honey) and 5. Pura or guggulu (Commiphora mukul); the group of these five drugs is branded as 'mitra-pañcaka'. These drugs are together used in 'dhātu drāvaṇa' (the pharmaceutical procedure followed to melt selected metals).

Note: The 'apunarbhava parīkṣā' of selected 'dhātu bhasma', done to test their perfectness, may be done with the help of 'mitra-pañcaka' dravya.

**31. Tāḍana:**

संसृष्टलोहयोरेकलोहस्य परिनाशनम् । प्रध्मानात् वङ्कनालेन तत्ताडनमुदाहृतम् ।। (R. R. S. 8/34)

Subjecting an alloy containing two or more than two metals to required intense heat with the help of 'vaṅkanāla yantra' (blower) with the intention of extracting the prominent metal from the alloy is called as 'tāḍana'.

This metal obtained here is called as 'tāḍita dhātu' and it will be in the purest of the forms with no mixture of any other metal in it. Example:Bronze is and alloy of 'copper' and 'tin'. With the help of required intense heat if copper is extracted from the bronze, the obtained copper is 'tāḍita tāmra'.

### 32. Gorvara:

गोखुरैस्ताडितं गोष्ठे शुष्कं चूर्णोपमञ्च यत् । गोमयं तत्समाख्यातं बुधैर्गोर्वरसंज्ञकम् ॥

(R. T. 2/12)

The dry cow dung in 'gośālā' (the place where the cows are tied; गोष्ठे = योनिवासस्थले) is roughly powdered by the hooves of the cows. This dry cow dung powder is called as 'gorvara'. It is used as heat source in many of the pharmaceutical procedures.

### 33. Viḍa:

क्षारैरम्लैश्च गन्धाद्यैर्मूत्रैश्च पटुभिस्तथा । रसग्रासस्य जीर्णार्थं तद्विडं परिकीर्तितम् ॥ (R. R. S. 8/86)

The 'kṣāra dravya' (like yavakṣāra, sarjakṣāra and ṭaṅkaṇa), nimbū and such other 'amla dravya', gandhaka and such other 'dhātu' (metals and minerals), gomūtra and other types of 'mūtra', saindhava and other types of 'lavaṇa'; out of all these dravya, either one or more than one are combined together and a mixture is prepared.

This mixture is digested in 'mercury' only with the intention of boosting up its appetite. With improved appetite, the mercury becomes efficient enough to completely digest other metals and minerals in it.

### 34. Kṣetrīkaraṇa:

सञ्जातपञ्चकृत्यस्य जैत्रैर्यद् गदनाशनम् । रसायनादौ तत्प्राज्ञैः क्षेत्रीकरणमुच्यते ॥ (R. T. 7/79)

Making the body (here 'kṣetra') fit (as 'roga śamanopayogī' and 'rasāyanopayogī' kṣetra) for administration of 'roga śamana auṣadha' and 'rasāyana auṣadha' through specified procedures of pañcakarma (vamana, virecana, basti, nasya and raktamokṣaṇa) to attain better results in terms of disease cure and rejuvenation is called as 'kṣetrīkaraṇa'.

Note: Here 'jaitra' is 'bheṣaja' or medicine. As the land must be ploughed and prepared before sowing seeds, in the similar way the body has to be made fit through pañcakarma therapy before administration of 'rasāyana auṣadha'. All such measures taken to make the body fit (as 'rasāyanopayogī kṣetra') for administration of 'rasāyana auṣadha' is collectively termed as 'kṣetrīkaraṇa'.

### 35. Sṛṣṭyambu:

सृष्ट्यम्बुजम अरुग्णाया: षोडशवार्शिक्या: स्त्रिया रज: ।
तदुक्तं शक्त्यवतारे– गोऽजाऽविनरनारीणां मूत्रं शुक्रं च शोणितम् । (Āy. Pra. 1/88-89 Ṭīkā)

Sṛṣṭyambu is believed to be the menstrual flow of a healthy 16 years aged girl. Many other authors consider the mūtra, śukra and ārtava as 'sṛṣṭyambu'. Here 'ambuja' also means 'saindhava lavaṇa', therefore some other authors consider 'sṛṣṭyambu' as saline water.

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## Chapter 4

# DRAVYA VARGĪKARAṆA

## (Classified Drugs)

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### 1. Amlavarga:

जम्बीरं निम्बुकञ्चैव त्वम्लवेतसमम्लिका । नारङ्गं दाडिमञ्चैव वृक्षाम्लं बीजपूरकम् ।।
चाङ्गेरी चणकाम्लञ्च कर्कन्धुः करमर्दकः । चुक्रिका चेति सामान्यादम्लवर्गः प्रकीर्तितः ।।
(R. T. 2/13-14)

Jambīra nimbū (Citrus lemon), Amlavetasa (Garcinia pedunculata), Amlikā (Tamarindus indicus), Nāraṅga (Citrous reticulata), Dāḍima (Punica granatum), Vṛkṣāmla (Garcinia indica), Bījapūraka (Citrus medica), Cāṅgerī (Oxalis corniculata), Caṇakāmla (acidic plant exudate of caṇaka), Karkandhu (Zizipus nmlaria), Karamardaka (Carrissa carandus) and Cukrikā (Rumex vesicaris); all these drugs are generally counted under the 'amlavarga'. Wherever, amlavarga dravya mardana or bhāvanā is specified in the pharmaceutical procedures, there the juice of any of these drugs is used for the purposes.

### 2. Kṣīratrayam:

रविक्षीरं वटक्षीरं स्नुहीक्षीरन्तथैव च । क्षीरत्रयमिति ख्यातं मारणादौ प्रशस्यते ।। (R. T. 2/23)

1. Arka kṣīra (Milky exudates of Calotropis procera)
2. Vaṭa kṣīra (Milky exudates of Ficus benghalensis/Banyan tree)
3. Snuhī kṣīra (Milky exudates of Euphorbia neriifolia)

The group of these 3 milky exudates is branded as 'kṣīratrayam'.

### 3. Madhuratrika:

आज्यं गुडो माक्षिकञ्च विज्ञेयं मधुरत्रिकम् । मतं त्रिमधुरञ्चापि तथैव मधुरत्रयम् ।।
(R. T. 2/20)

1. Ājya (ghee)
2. Guḍa (jaggary)
3. Mākṣika (honey)

The group of these 3 drugs is branded as 'madhuratrika'.

### 4. Pañcagavyam:

गव्यं क्षीरं दधि घृतं गोमूत्रं गोमयं तथा । एकत्र योजितं तुल्यं पञ्चगव्यमिहोच्यते ।। (R. T. 2/22)

1. Godugdha (cow's milk)
2. Godadhi (curd made out of cow's milk)

3. Goghṛta (ghee made out of cow's milk)
4. Gomūtra (cow's urine)
5. Gomaya (cow's dung)

The group of these five is categorized as pañcagavya.

**5. Pañcāmṛtam:**

> गव्यं क्षीरं दधि घृतं माक्षिकञ्चाथ शर्करा । पञ्चामृतं समाख्यातं रसकर्मप्रसाधकम् ।।
>
> (R. T. 2/21)

1. Godugdha (cow's milk)
2. Godadhi (curd made out of cow's milk)
3. Goghṛta (ghee made out of cow's milk)
4. Mākṣika (Honey)
5. Śarkarā (Sugar)

The group of these five is categorized as pañcāmṛta varga, which are used in some of the pharmaceutical procedures.

**6. Kṣārāṣṭaka:**

> सुधापलाशशिखरचिञ्चार्कतिलनालजाः । स्वर्जिका यावशूकश्च क्षाराष्टकमुदाहृतम् ।।
>
> (R. T. 2/8)

1. Snuhī (sudhā) kṣāra
2. Palāśa kṣāra
3. Apāmārga (śikharī) kṣāra
4. Ciñcā kṣāra
5. Arka kṣāra
6. Tila kṣāra
7. Swarjikā kṣāra
8. Yava kṣāra

The group of these 8 types of kṣāra is called as 'aṣṭakṣāra varga' or 'kṣārāṣṭaka'.

**7. Drāvaka gaṇa:**

> गुञ्जा मधु गुडः सर्पिः सौभाग्यं गुग्गुलुस्तथा । पूर्वाचार्यैः कीर्तितोऽयं धातूनां द्रावको गणः ।।
>
> (R. T. 2/35)

1. Guñjā (Abrus precatorius) 2. Madhu (honey) 3. Guḍa (jaggary) 4. Sarpiḥ (ghee) 5. Ṭaṅkaṇa (Borax) and 6. Guggulu (Commiphora mukul); the group of all these drugs are together branded as 'dhātu-drāvaka gaṇa'. This set of drugs is used in many pharmaceutical procedures.

**8. Mitra-pañcaka:**

> आज्यं गुञ्जाथ सौभाग्यं क्षौद्रं च पुरसंज्ञकम् । एतत्तु मिलितं विज्ञैर्मित्रपञ्चकमुच्यते ।।
> विविधानां तु लोहानां द्रावणाय विशेषतः । रसतन्त्रविशेषज्ञैर्युज्यते मित्रपञ्चकम् ।।
>
> (R. T. 2/37-38)

1. Ājya (ghee) 2. Guñjā (Abrus precatorius) 3. Ṭaṅkaṇa (soubhāgya; borax) 4. Kṣoudra (madhu; honey) and 5. Pura or guggulu (Commiphora mukul); the group of these five drugs is branded as 'mitra-pañcaka'. These drugs are together used in 'dhātu drāvaṇa' (the pharmaceutical procedure followed to melt selected metals).

Note: The 'apunarbhava parīkṣā' of selected 'dhātu bhasma', done to test their perfectness, may be done with the help of 'mitra-pañcaka' dravya.

**9. Raktavarga:**

कुसुम्भं खदिरो लाक्षा मञ्जिष्ठा रक्तचन्दनम् । आक्षी च बन्धुजीवश्च तथा कर्पूरगन्धिनी ।।
माक्षिकञ्चेति विज्ञेयो रक्तवर्गोऽतिरञ्जनः ।। (R. R. S. 10/88)

1. Kusumbha (Carthamus tinctoria) puṣpa 2. Khadira twak 3. Lākṣā 4. Mañjiṣṭha 5. Raktacandana 6. Śobhāñjana with red flowers (akṣīva) 7. Bandhujīva (dupahariyā) 8. Karpūragandhinī and 9. Swarṇa mākṣika; all these drugs are considered under 'raktavarga'.

Note: The drugs of 'raktavarga' are used in the pharmaceutical procedures where, the red colour needs to be imparted on to the drug. It is said to be used for the purpose of 'lohitīkaraṇa' and is used in different 'pārada saṁskāra' of 'dhātuvāda'.

**10. Śwetavarga:**

तगरः कुटजः कुन्दो गुञ्जा जीवन्तिका तथा । सिताम्भोरुहकन्दश्च श्वेतवर्ग उदाहृतः ।।
(R. R. S. 10/90)

1. Tagara 2. Kuṭaja 3. Kunda puṣpa 4. Śweta guñjā 5. Jīvantī 6. Śweta kamala puṣpa and kanda; all these drugs are considered under 'śwetavarga'.

Note: The drugs of 'śwetavarga' are used in the pharmaceutical procedures where, the white colour needs to be imparted on to the drug. It is said to be used in different 'pārada saṁskāra' of 'dhātuvāda'.

**11. Lavaṇa pañcaka:**

सैन्धवञ्चाथ सामुद्रं विडं सौवर्चलं तथा । रोमकञ्चति विज्ञेयं बुधैर्लवणपञ्चकम् ।। (R. T. 2/3)

1. Saindhava lavaṇa (Sodi chloridum)
2. Sāmudra lavaṇa (Sodi muras)
3. Viḍa lavaṇa (Black salt)
4. Souvarca lavaṇa (Unaqua sodium chloride)
5. Romaka lavaṇa (Lake salt)

The group of these five salts is called as lavaṇapañcaka varga.

### 12. Lavaṇatrika:

सिन्धुजं रुचकं पाक्यमेतत् त्रिलवणं स्मृतम् । प्रकीर्तितश्च लवणत्रिकं वा लवणत्रयम् ।।
(R. T. 2/4)

1. Saindhava lavaṇa (Sodi chloridum)
2. Souvarca lavaṇa (Unaqua sodium chloride)
3. Viḍa lavaṇa (Black salt)

The group of these three salts is called as lavaṇatrika varga.

### 13. Kṣāradvaya and kṣāratrika:

स्वर्ज्जिक्षारो यवक्षारः क्षारद्वयमुदाहृतम् । सौभाग्येन समायुक्तं क्षारत्रिकमुदाहृतम् ।। (R. T. 2/6)

- Kṣāradvaya: 1. Sarja kṣāra and 2. Yava kṣāra;
- Kṣāratrika: 1. Sarja kṣāra 2. Yava kṣāra and 3. Ṭaṅkaṇa.

### 14. Kṣārapañcaka:

मुष्कक्षारो यवक्षारः किंशुकक्षार एव च । स्वर्ज्जिक्षारस्तिलक्षारः क्षारपञ्चकमुच्यते ।। (R. T. 2/7)

1. Muṣka kṣāra 2. Yava kṣāra 3. Kiṁśuka kṣāra 4. Swarji kṣāra and 5. Tila kṣāra; are the five drugs listed out as 'kṣārapañcaka'.

### 15. Mūtrāṣṭaka:

सैरिभाजाविकरभगोखरद्विपवाजिनाम् । मूत्राणीति भिषग्वर्यैर्मूत्राष्टकमुदाहृतम् ।।
खरेभोष्ट्रतुरङ्गाणां पुंसां मूत्रं प्रशस्यते । गोजाविमहिषीणाञ्च मूत्रं स्त्रीणां हितं मतम् ।।
निखिलेष्वपि मूत्रषु गोमूत्रं गुणवत्तमम् । अतो विशेषानुक्तौ तु गोमूत्रं विनियोजयेत् ।।
(R. T. 2/9-11)

1. Mahīṣa-mūtra (sairibhī) (buffalo's urine)
2. Aja-mūtra (goat's urine)
3. Avi-mūtra (sheep's urine)
4. Uṣṭra-mūtra (karabha) (camel's urine)
5. Gomūtra (cow's urine)
6. Khara-mūtra (donkey's urine)
7. Hasti-mūtra (elephant's urine)
8. Haya-mūtra (horse's urine)

The group of these 8 animal urines is called as aṣṭamūtra varga or mūtrāṣṭaka. The urine of camel, donkey, elephant and horse should be selected from male species. The urine of cow, goat, sheep and buffalo's milk should be taken from female species.

Out of all these urines, the cow's urine is considered to be therapeutically the best one. Therefore, wherever the term 'mūtra' is mentioned in the classics without any other specifications, there, cow's urine has to be taken.

### 16. Amlapañcaka:

अम्लवेतसजम्बीरलुङ्गनारङ्गनिम्बुकैः । फलपञ्चाम्लकं ख्यातं कीर्तितञ्चाम्लपञ्चकम् ।।

(R. T. 2/15)

1. Āmlavetasa (Garcinia pedunculata)
2. Jambīra nimbū (Citrus lemon)
3. Mātuluṅga (Citrus medica)
4. Nāraṅga (Citrous reticulata)
5. Nimbūka (Citrus lemon)

The group of these 5 drugs is branded as 'amlapañcaka' or 'pañcāmla varga'.

### 17. Amlapañcaka (another group):

कोलदाडिमवृक्षाम्लचाङ्गेरीचिञ्चिकारसैः । पञ्चाम्लकं समाख्यातं त्वम्लपञ्चकमेव च ।।
सर्वेषामम्लजातीनां निम्बूकं गुणवत्तमम् । अम्लवेतसकं वापि त्वम्लिका वा गुणाधिका ।।

(R. T. 2/16-17)

1. Kola (badara) (Ziziphus jujuba)
2. Dāḍima (Punica granatum)
3. Vṛkṣāmla (Tamarindus indicus)
4. Cāṅgerī (Oxalis corniculata)
5. Ciñcā (Tamarindus indicus)

The group of these 5 drugs is branded as 'pañcāmlaka' or 'amlapañcaka'. Out of all these 'amlavarga' dravya 'nimbūka' (Citrus lemon) is considered to be of high therapeutic values. 'Amlavetasa' (Garcinia pedunculata) and 'amlikā' (Tamarindus indicus) are also considered useful for therapeutic purposes.

### 18. Pañcatiktaka:

गुडूची निम्बमूलत्वक् भिषङ्माता निदिग्धिका । पटोलपत्रमित्येतत् पञ्चतिक्तं प्रकीर्तितम् ।।

(R. T. 2/18)

1. Guḍūcī (Tinospora cordifolia)
2. Nimbamūla twak (Azadirachta indica)
3. Vāsā (Bhiṣaṅmātā) (Adhatoda vasica)
4. Kaṇṭakārī (Nidigdhikā) (Solanum surattense)
5. Paṭola patra (Trichosanthes dioica)

The group of these 5 drugs is branded as 'pañcatiktaka' or 'tiktapañcaka'.

### 19. Pañcamṛttikā:

इष्टिकाचूर्णकं भस्म तथा वल्मीकमृत्तिका । गैरिकं लवणञ्चेति कीर्तिताः पञ्चमृत्तिकाः ।।

(R. T. 2/19)

1. Iṣṭikā cūrṇa (Brick powder)
2. Bhasma (Wood ash)
3. Valmīka mṛttikā (Ant hill mid)
4. Gairika (Haematite)
5. Saindhava lavaṇa (Sodi chloridum)

The group of these 5 drugs is branded as 'pañcamṛttikā'.

**20. Dugdhavarga:**

> करिणी घोटिका धेनुस्त्वविका छागिकोष्ट्रिका । महिषी गर्दभी नारी काकोदुम्बरिका सुधा ।।
> दुग्धिकोदुम्बरश्चार्को न्यग्रोधोऽश्वत्थतिल्वकौ । एषां दुग्धैःसमाख्यातो दुग्धवर्गः समासतः ।।
> (R. T. 2/24-25)

Kariṇī dugdha (elephant's milk), Ghoṭikā dugdha (mare's milk), Go dugdha (cow's milk), Avi dugdha (sheep's milk), Chāgi dugdha (goat's milk), Uṣṭra dugdha (camel's milk), Mahīṣa dugdha (buffalo's milk), Gardabhī dugdha (donkey's milk), Nārī dugdha (women's milk); all these breast milk are considered under 'jāṅgama dugdhavarga' (milks of animal origin).

The milky exudates of Dugdhikā (Euphorbia thymifolia), Udumbara (Ficus racemosa), Arka (Calotropis procera), Nyagrodha (Ficus bengalensis), Aśwattha (Ficus religiosa) and Tilvaka (Balanites roxburgii); are considered under 'sthāvara dugdhavarga' (milky exudates of plant origin).

**21. Tailavarga:**

> तिलसर्षपकोन्मत्तभल्लातैरण्डनिम्बजैः । उमादीनाञ्च तैलैस्तु तैलवर्गोऽत्र सम्मतः ।। (R. T. 2/26)

The oils extracted from Tila (Sesamum indicum), Sarṣapa (Brassica campestris), Dhattūra (Datura metal), Bhallātaka (Semecarpus anacardium), Eraṇḍa bīja (Ricinus communis), Nimba bīja (Azadirachta indica), Jayapāla bīja (Croton tiglium), Dantī bīja (Baliaspermum mantanum), Kusumbha bīja (Carthamus tinctoria), Atasī bīja (Linum usitatissimum) etc are considered under tailavarga.

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## Chapter 5

# YANTRA

## (Instruments)

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**Yantra- definition:**

स्वेदादिकर्मनिर्मातुं वार्तिकेन्द्रैः प्रयत्नतः । यन्त्र्यते पारदो यस्मात्तस्माद्यन्त्रमिति स्मृतम् ।।
(R. R. S. 9/2)

- Another reference:

रसोपरसलोहाद्या मारणाद्यर्थसिद्धये । यन्त्र्यन्तेऽनेन यस्मात्तु तस्माद् यन्त्रं प्रकीर्तितम् ।। (R. T. 4/1)

The different types of apparatus used for various pharmaceutical procedures such as swedana (steaming), mardana (trituration), śodhana (purification), māraṇa (incineration) etc on different rasa dravya (rasa, uparasa, dhātu etc) are called as 'yantra' (apparatus).

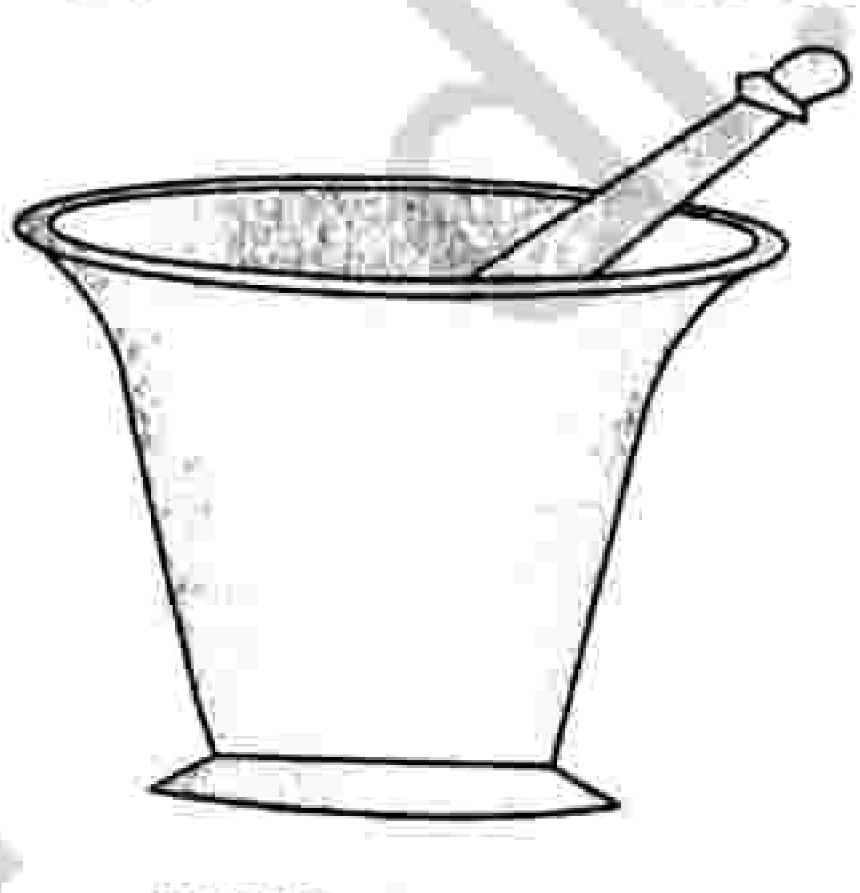
**1. Ulūkhala yantra:**

दशाङ्गुलन्तु विस्तारे तूत्सेधे षोडशाङ्गुलम् । त्रयोदशाङ्गुलं चैव निम्नत्वेन च संदृढम् ।।
अयसा निर्मितञ्चैव मद्येऽतिमसृणीकृतम् । विंशत्यङ्गुलदीर्घश्च लोहदण्डः सुशोभनः ।।
उलूखलाभिधं यन्त्रं बुधैरेतत्प्रकीर्तितम् । ताप्यादीनां कुट्टनार्थं यन्त्रमेतत्प्रयुज्यते ।।
लघूनि चाथ दीर्घाणि युक्त्या यन्त्राणि कारयेत् । द्रव्यमानानुकूल्येन विधानज्ञो भिषग्वरः ।।
यन्त्राण्येतानि प्रोक्तानि दिग्दर्शनतया मया । अध्येतृणां शिशूनान्तु सुखबोधाय सत्वरम् ।।
(R. T. 4/58-62)

A deep vessel shaped wooden, stone or iron mortar, which has height of 16 aṅgula, width of 10 aṅgula and depth of 13 aṅgula is identified as 'ulūkhala'.

It should be very soft, shiny and strong. Its pestle (peśiṇī) used here should be of wood, stone or iron with enough thickness and 20 aṅgula length. Both these 'ulūkhala' and 'peśiṇī' together are called 'ulūkhala yantra'.

This yantra is used for pounding different types of herbal (leaves, roots, tubers etc) and mineral (rasoparasa, loha etc) drugs during pharmaceutical procedures.



**Ulūkhala yantra**

**2. Khalva yantra:**

चषकोपममत्यच्छं सुदृढ पिच्छिलोपमम् । सच्छिलाविहितं पात्रं खल्वयन्त्रमिहोच्यते ।। (R. T. 4/53)

A bigger sized, strong 'pestle and mortar', usually made of stone or iron, ei-

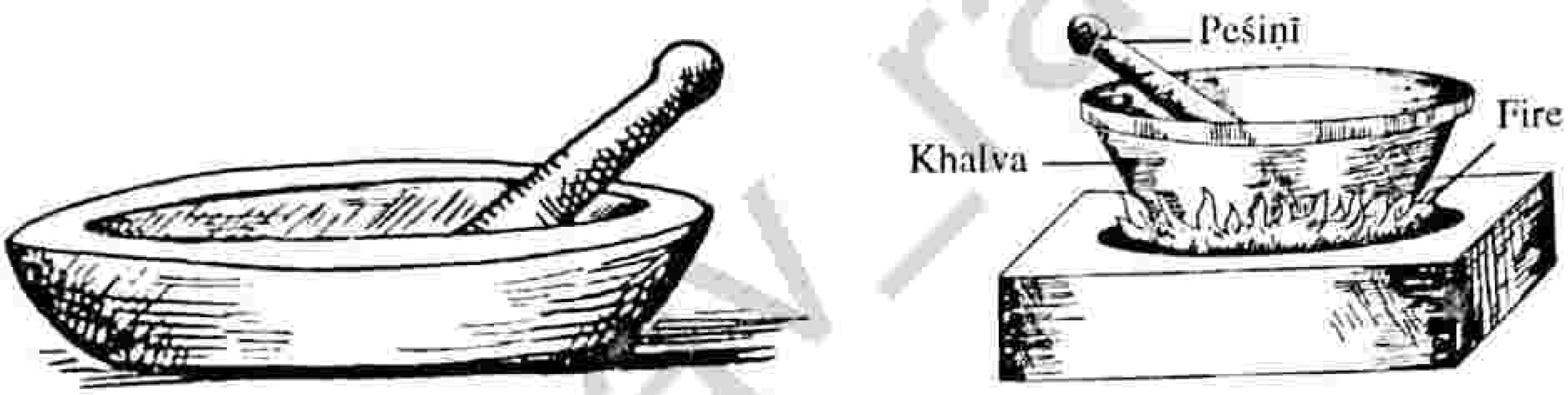


**Fig. : Khalva yantra**

ther in circular or in elliptical shape with soft and smooth inner side is called as 'khalva yantra'.

**Khalva yantra- Utility:**

रसोपरसलोहादेः पेषणादिककर्मणि । रसतन्त्रक्रियादक्षैः खल्वयन्त्रं प्रयुज्यते ॥ (R. T. 4/54)

The 'khalva yantra', which includes both pestle and mortar, is used for pounding or triturating different types of herbal (leaves, roots, tubers etc) and mineral (rasoparasa, loha etc) drugs.

**Khalva yantra- types:**

खल्वयन्त्रं द्विधा प्रोक्तं  रसतन्त्रे विशेषतः । प्रथमं वर्तुलाकारं द्रोणीरूपं द्वितीयकम् ॥
(R. T. 4/55)

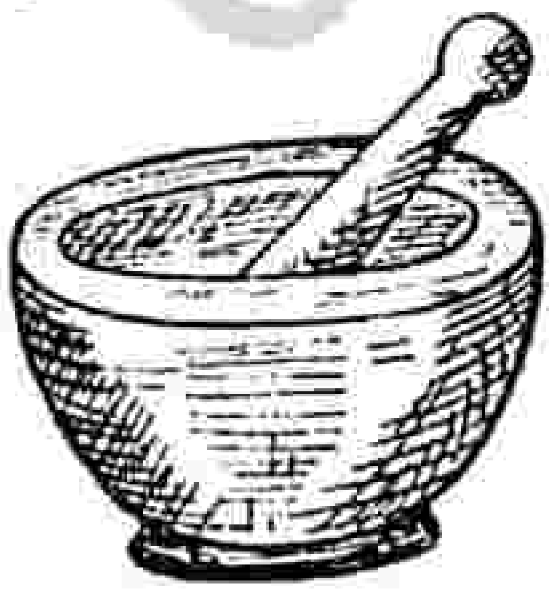
There are two types of khalva yantra that are used for all the pharmaceutical procedures;

A. Vartulākāra (Circular) khalva yantra
B. Droṇīrūpa (Elliptical) khalva yantra

**a. Vartula khalva yantra:**

विस्तारे तपनाङ्गुलः समतलो नीलाब्जतुल्यप्रभः
निम्नत्वे च नवाङ्गुलः सुमसृणो रुद्राङ्गुलोच्छ्रायवान् ।
भित्त्या द्व्यङ्गुलसंमितः खलु यथा चेन्द्राङ्गुलो घर्षकः
खल्वोऽयं खलु वर्तुलो निगदितः सूतादिसिद्धिप्रदः ॥ (R. T. 4/56)

The circular shaped iron or stone mortar with width of 12 aṅgula, depth of 9 aṅgula and height of 11 aṅgula is identified as 'vartula khalva'. The body of the khalva should be uniform, soft and of 'nīlakamala' colour. Its walls should be of 2 inch thickness.



**Vartula khalva yantra**

The pestle (peśiṇī) used here should be of 14 aṅgula length and should be made of iron or stone. This khalva yantra is used for pounding or triturating different types of herbal

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(leaves, roots, tubers etc) and mineral (rasoparasa, loha etc) drugs during pharmaceutical procedures.

**b. Droṇirūpa khalva:**

उत्सेधे तुरङ्गागुलः खलु कलातुल्याङ्गुलश्चायतौ विस्तारे तपनाङ्गुलश्च मसृणा भित्त्या च वै द्वयङ्गुलः ।
घर्षः सूर्यसमाङ्गुलः सुविशदो लोहादिभिर्निर्मितः खल्वोऽयं रससिद्धिकृन्निगदितो द्रोणीनिभोऽत्युत्तमः ॥

(R. T. 4/57)

The elliptical shaped iron or stone mortar with height of 7 aṅgula, length of 16 aṅgula and width of 12 aṅgula is identified as 'droṇarūpa khalva'. Its walls should be of 2 inch thickness. The body of the khalva should be uniform and soft.

The pestle (peśiṇī) used here should be of 12 aṅgula length and should be made of iron or stone. This khalva yantra is also used for pounding or triturating different types of herbal (leaves, roots, tubers etc) and mineral (rasoparasa, loha etc) drugs during pharmaceutical procedures.

**3. Tapta khalva yantra:**

लौहो नवाङ्गुलः खल्लो निम्नत्वे च षडङ्गुलः । मर्दकोऽष्टाङ्गुलश्चैव तप्तखल्लाभिधोऽप्ययम् ॥

(R. R. S. 9/85)

A khalva yantra prepared by iron, measuring nine āṅgula (18 cms) in length, six aṅgula (12 cms) in width and depth. The pestle is also made of iron and it should be of eight-aṅgula length (16 cms).

This khalva yantra is placed over an iron stand specially meant to place this yantra. While the trituration process is carried out, the 'glowing charcoal' are placed in a 'śarāva' and kept beneath the khalva yantra. The heat generated below keeps the yantra warm and assists in the pharmaceutical procedure. (Ref: R. R. S. 9/86)

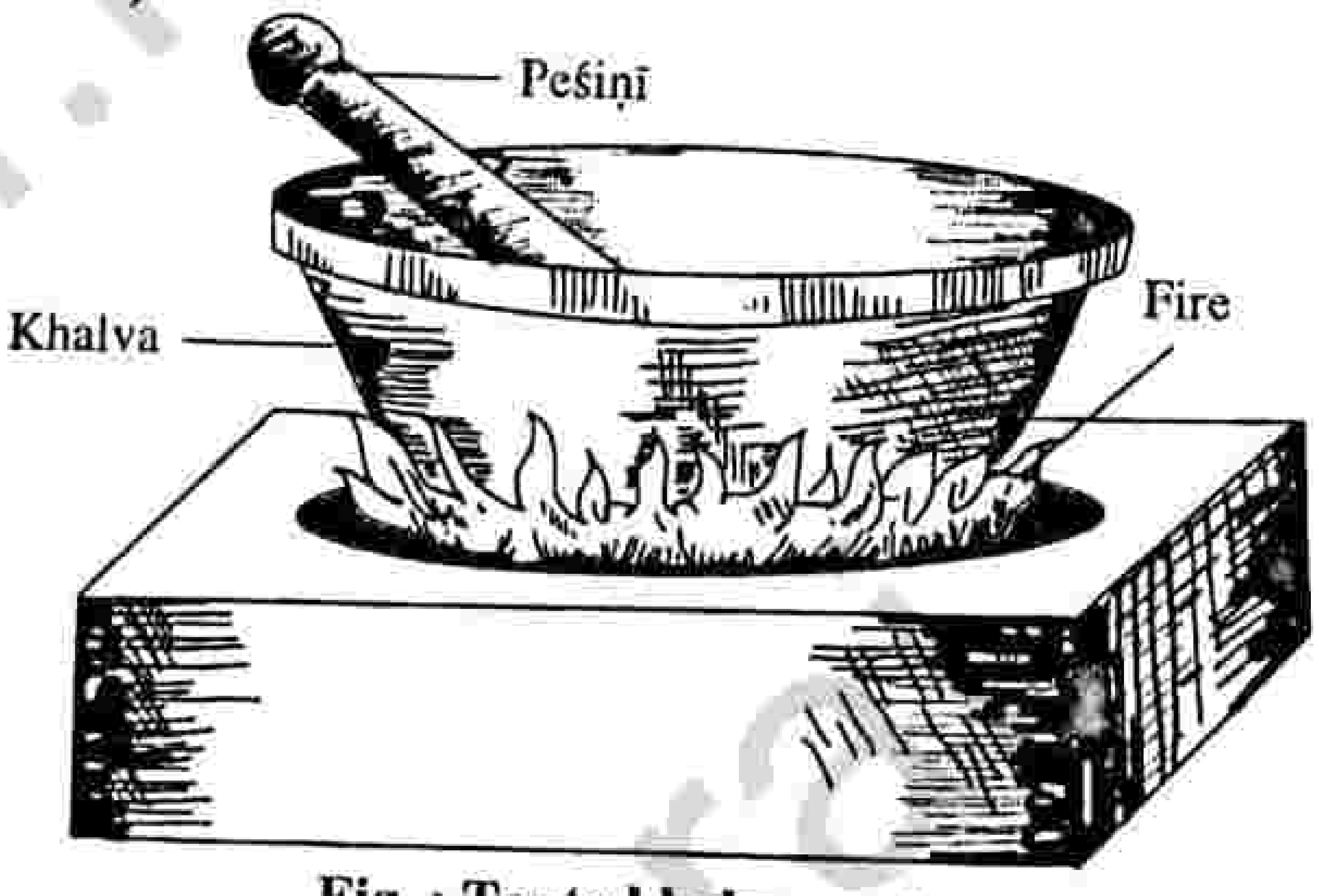


Fig. : Tapta khalva yantra

### 4. Kacchapa yantra:

जलपूरितभाजनमध्यगते घटखर्परके विनिधाय रसम् ।
बलिमध्यगतं कुमुदीनिहितं चषकेण भृशं पिदधीत ततः ।।
कृतसन्धिविलेपनमम्बुमृदा खलु खादिरकोकिलकैर्ज्वलनम् ।
परिदीप्यभृशं सुपचेद् गदितं किल कच्छपसंज्ञकयन्त्रमिदम् ।।
बलिजारणसिद्ध्यर्थं यन्त्रं कच्छपसंज्ञकम् । समाख्यातं रसाचार्यैं रससिद्धप्रदायकम् ।।

(R. T. 4/18-20)

A wide circular vessel (earthen or of any metal) measuring 15 to 20 aṅgula width is selected. Half of the vessel is filled with water. Another similar vessel comparatively smaller than the earlier one, which can float in the water of the earlier vessel is selected.

Now, the crucible filled with the medicine (pārada, gandhaka etc) is placed in the middle of the smaller vessel and it is covered inverted with a strong earthen lid (mṛt-śarāva) as shown in the figure. The edge of the lid is properly sealed with wet mud.

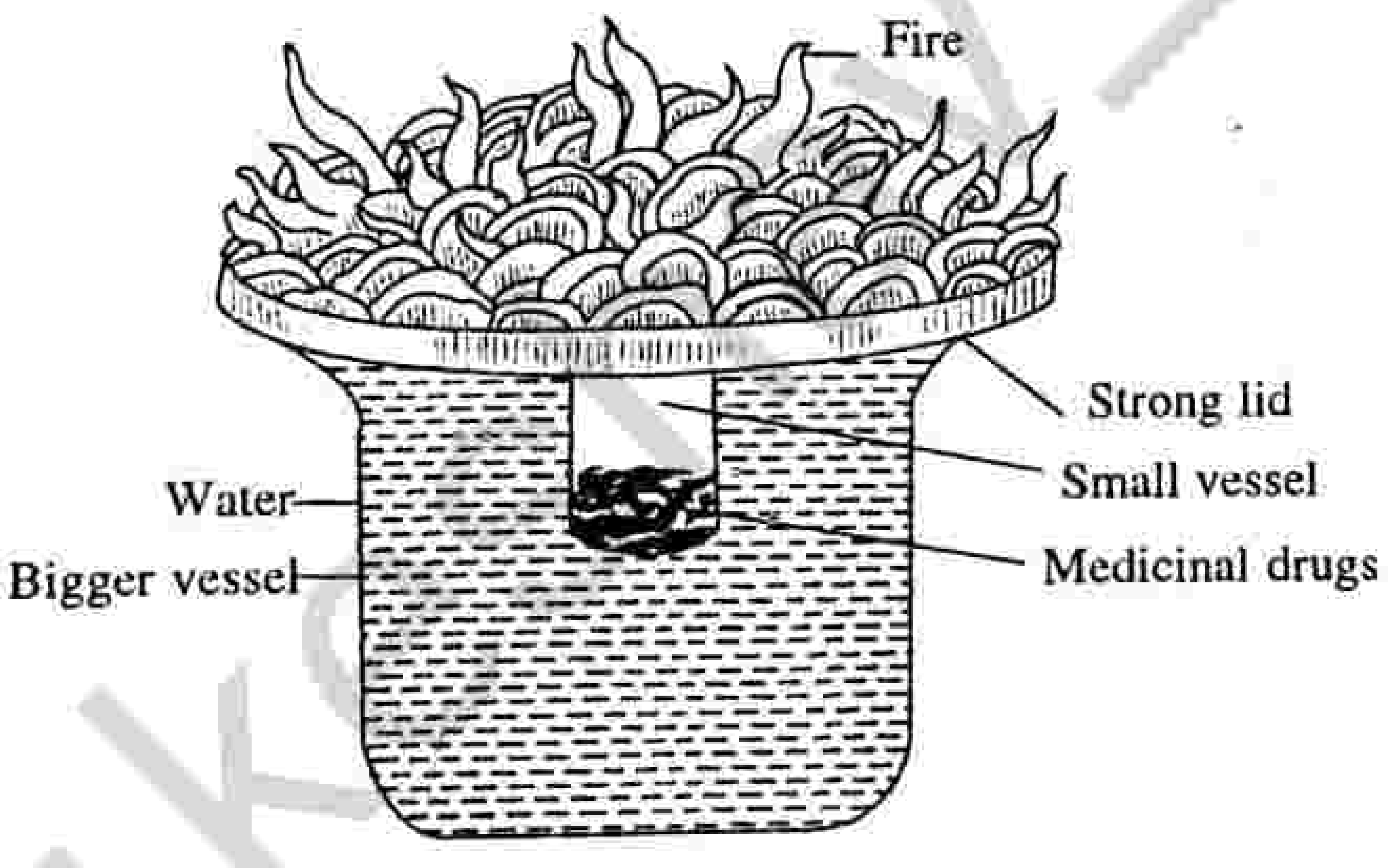


**Fig. : Kacchapa yantra**

Above by lid on all sides in the small vessel, the charcoal are filled and ignited. By doing so, the 'gandhaka jāraṇa' takes place. This 'yantra' is called as 'kacchapa yantra'. This yantra is prominently used for 'gandhaka jāraṇa' and it is also called as 'jala-kūrma yantra' by some other authors.

### Pātana yantra:

The 'pātana procedure' and the 'pātana yantra' are the rudimentary forms of present-day 'distillation process' and 'simple distillation apparatus'. As per our classics there are 3 types of 'pātana yantra' as mentioned below;

- Ūrdhwa-pātana yantra

- Adhaḥ-pātana yantra
- Tiryak-pātana yantra

### 5. Ūrdhwa-pātana yantra:

द्वादशाङ्गुलमुखी सुवर्तुला सुदृढा च खलु गर्भविस्तृता ।
अङ्गुलद्वयमितोष्ठसंयुता पातने भवति निम्नगा घटी ।।
उक्तसर्वगुणसंयुता तले छिद्रयुक्तदृढवृत्तिकान्विता ।
ऊर्ध्वगा च जठरोज्ज्वला घटी तूर्ध्वपातनविधौ प्रशस्यते ।।
निम्नगायां रसं क्षिप्त्वा मेलयेदनयोर्मुखम् । सम्वेष्ट्य शोषयेत् सन्धिं चुल्ल्यामारोपयेत्ततः ।।
नलिकां वृत्तिकाछिद्रे न्यस्य सन्धिं प्रलेपयेत् । वृत्तिमध्ये क्षिपेत्तोयं नलिकामुखमार्गतः ।।
तप्तं निष्कासयेत्तोयं शीतलञ्च विनिक्षिपेत् । रसज्ञैः कीर्तितमिदमूर्ध्वपातनयन्त्रकम् ।।

(R. T. 4/6-10)

To construct ūrdhwa-pātana yantra, a strong, bigger sized mud pot is selected. The circular mouth of the pot should be of 12 aṅgula width. The edge of the mouth should be of 2 aṅgula height.

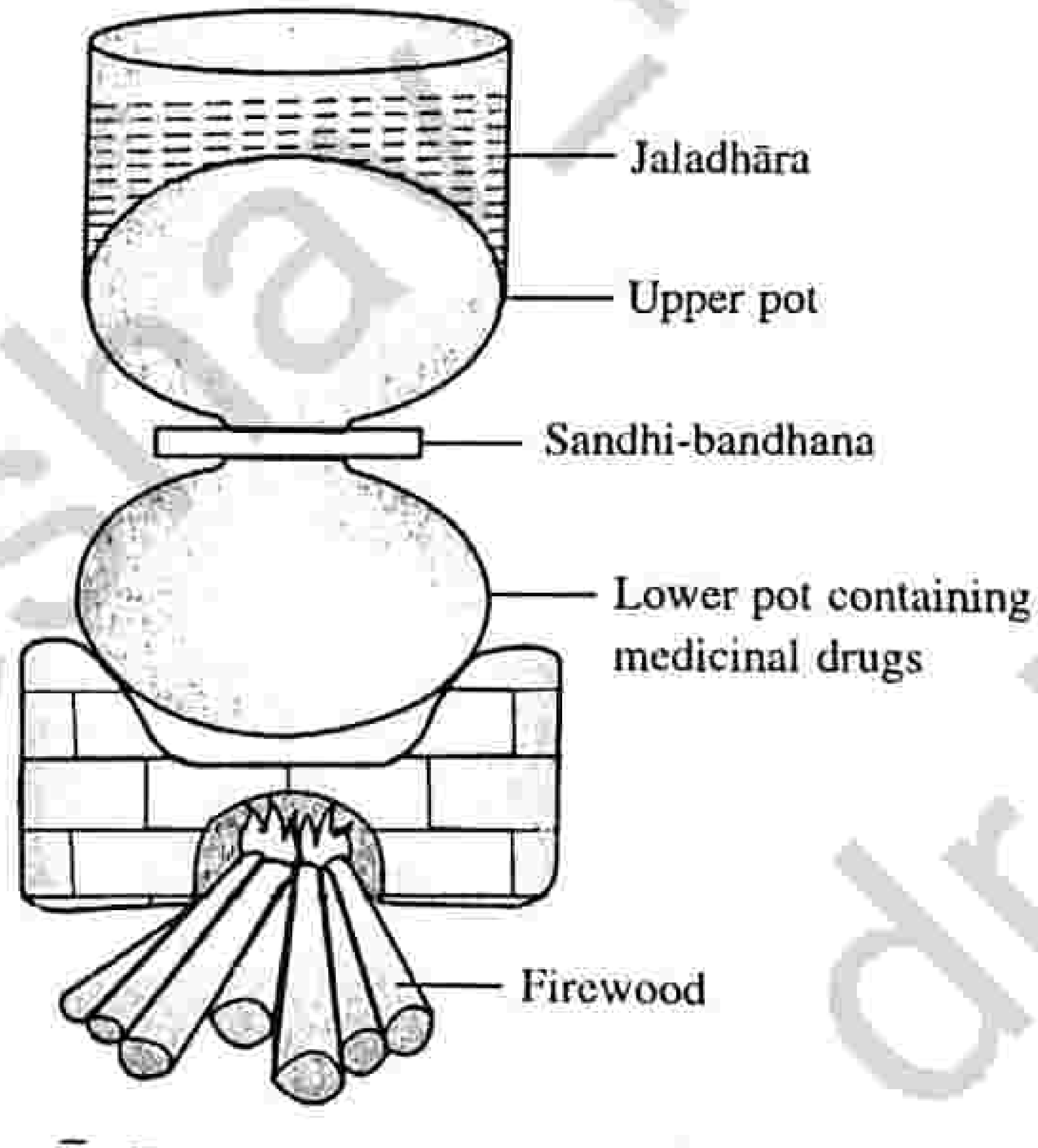


**Fig : Ūrdhwa-pātana yantra**

Now, another mud pot of same size is selected with an extra base of 4 aṅgula height, which may be used as 'jaladhāra' during the pātana process. At one side of this extra base, a hole is carved and a small pipe of suitable size is fixed and sealed. The other end of the pipe is knotted.

Now the first mud pot is placed upright and filled with the 'pārada' triturated with specified medicinal drugs. Over this, the second pot (with extra base) is placed inverted and the mouths of both the pots are properly sealed with wet mud and cloth (mṛtkapaṭita). This is called the 'ūrdhwa-pātana yantra'.

Now this yantra is carefully placed over fire (cullikā or gas stove). The extra base of the upper pot is filled with water. When this water becomes hot, it is let out by opening the knot in the pipe and filled with fresh cold water. By doing so, the 'pārada' from the base of the lower pot, gradually evaporates and gets deposited in droplet format at the base of the upper pot (beneath the 'jaladhāra').

After application of heat for a day, the yantra is allowed to cool down overnight on its own. Next morning the sealed pots are separated and the mercury at the base of the upper pot is carefully collected. This type of yantra used for evaporating pārada is called as 'ūrdhwa-pātana yantra'.

Note: Instead of using a pot with extra base that may be used as 'jaladhāra', a wet cloth may be placed over the base of the upper pot and the cloth may be frequently changes as it becomes warm.

### 6. Adhaḥ-pātana yantra:

ऊर्ध्वपात्रान्तरे सूतं लिप्त्वाधः पात्रके जलम् । निक्षिप्य भूमौ गतेऽच विधाय विन्यसेद् दृढम् ॥
प्रदीप्तौश्छगणैस्तत्र वह्निं प्रज्वालयेद् भृशम् । रसज्ञैः कीर्तितमिदमधः पातनयन्त्रकम् ॥
(R. T. 4/11-12)

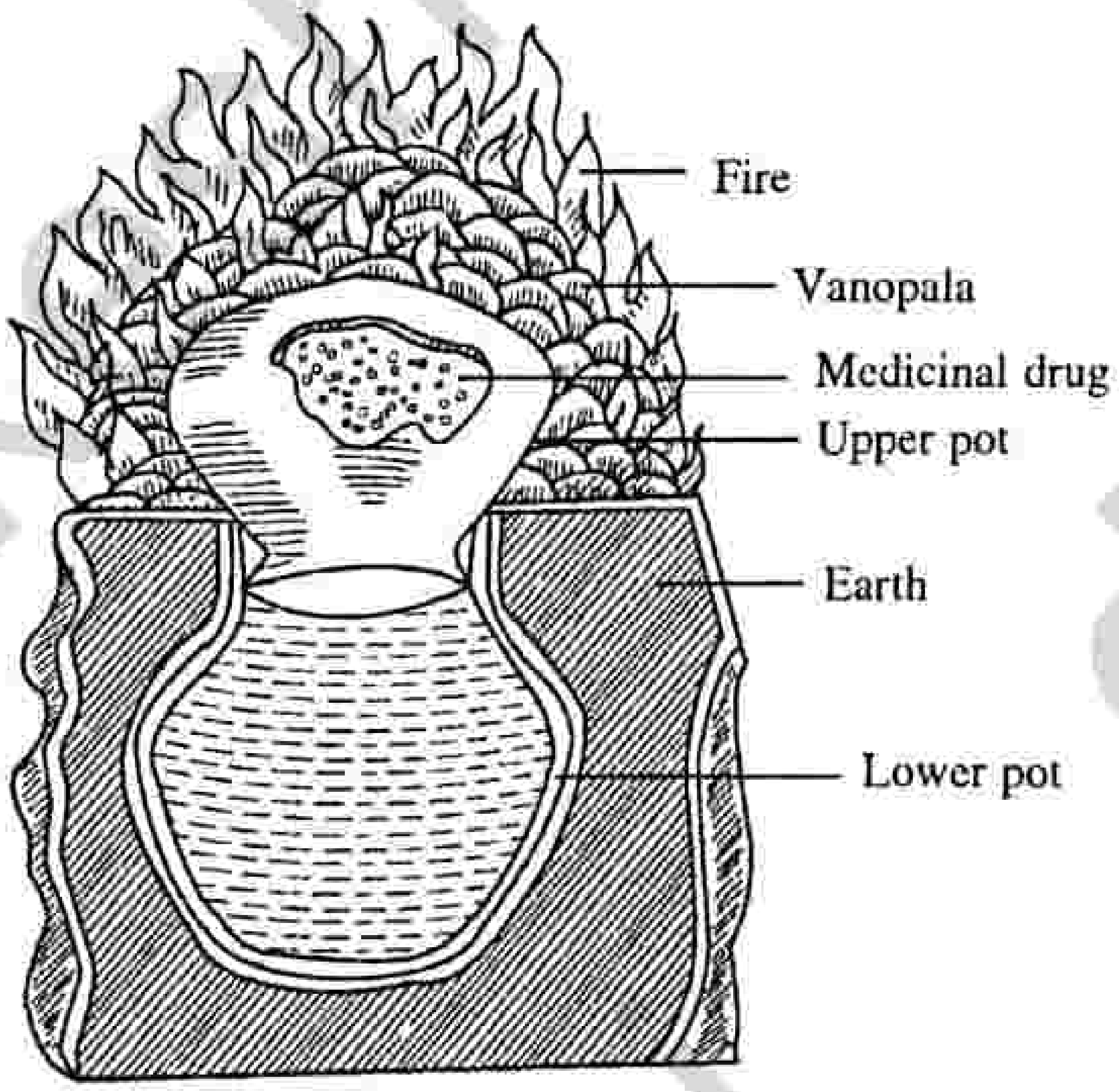


Fig : Adhaḥ-pātana yantra

To construct adhaḥ-pātana yantra, two strong mud pots of uneven sizes are selected. The bigger mud pot is cleaned, dried and carefully buried upright inside the earth up to neck level.

The second smaller pot is also cleaned and its inner surface is applied with the 'lepa' prepared by trituration of 'pārada' with other specified drugs. This pot is placed inverted over the earlier buried pot and properly sealed with wet mud and cloth (mṛtkapaṭita).

Now around the upper pot, the specified number of dry cow dung cakes are heaped up and ignited. By doing so, the 'pārada' from the base of the upper pot, gradually trickles down and gets collected at the base of the lower pot (in water).

After application of heat for a day, the yantra is allowed to cool down overnight on its own. Next morning the sealed pots are separated and the mercury at the base of the lower pot is carefully collected by decanting the water in it. This type of yantra is called as 'adhaḥ-pātana yantra'.

### 7. Tiryak-pātana yantra:

नतनाले घटे दीर्घे रसराजं विनिक्षिपेत् । तन्नालं योजयेदन्यकुम्भगर्भे प्रयत्नतः ।।
रोधयेदथ यत्नेन रसगर्भघटीमुखम् । ततो रसघटस्याधो वह्निं प्रज्वालयेद् भृशम् ।।
पूरयेच्च घटं त्वन्यं विमलैः शीतलैर्जलैः । यन्त्रमेतत्समाख्यातं तिर्यक्पातनसंज्ञकम् ।।

(R. T. 4/13-15)

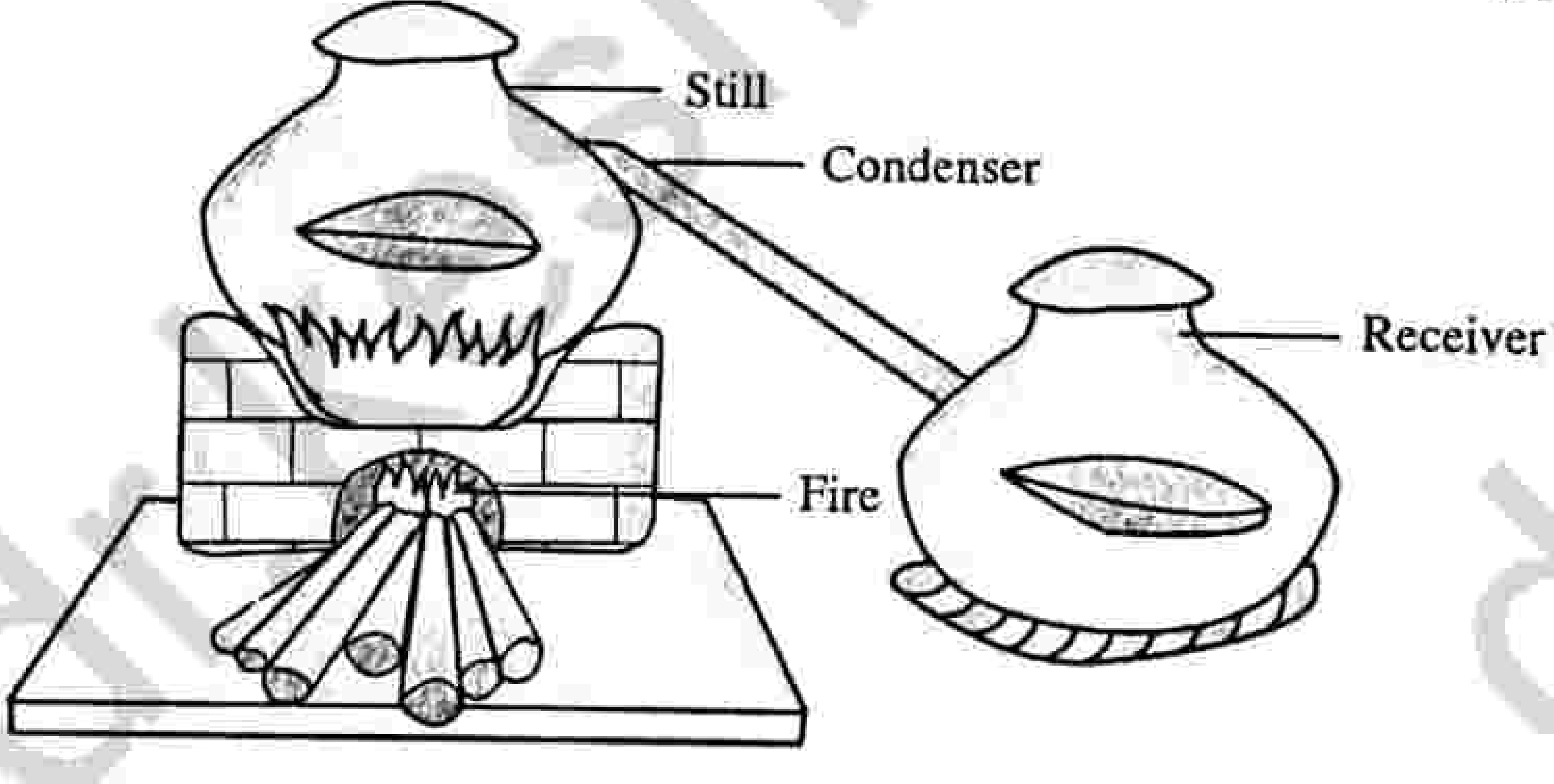


Fig. : Tiryak-pātana yantra

To construct tiryak-pātana yantra, two strong, bigger sized mud pots of equal size are selected. One pot is placed over oven (cullikā having a height of 1 foot) and the other pot is placed besides on the ground. Now these two pots are connected with a small steel pipe as shown in the picture by carving two suitable holes in the pots.

Now the pot placed over oven is filled with the 'pārada' triturated with specified medicinal drugs and the mouths of both the pots are sealed tightly with lids (śarāva) as shown in the figure. Now, the oven is ignited and the upper pot is heated. As the heating goes on, the mercury evaporates and passes through the pipe that bridges both the pots and gets collected in the lower pot.

The lower pot is frequently sprinkled or poured with cold water to facilitate the condensation of mercury. Alternatively, to prevent pouring or sprinkling of water from above, the lower pot may be filled with water before sealing.

After application of heat for a day, the yantra is allowed to cool down overnight on its own. Next morning the sealed pots are opened and the mercury at the base of the pot on the ground is carefully collected. This type of yantra is called as 'tiryak-pātana yantra'.

Note: The simple distillation apparatus may be readily used here for this purpose. But the above explanation is of traditional 'tiryak-pātana yantra'.

**8. Tulā yantra:**

वृन्ताकाकारभूषे द्वे तयोः कण्ठादधः खलु । प्रादेशमात्रां नलिकां मृदालिप्तां सुसन्धिकाम् ।।
तत्रैकस्यां क्षिपेत्सूतमन्यस्यां गन्धचूर्णकम् । निरुद्ध्य मूषयोर्वक्त्रं बालुकायन्त्रके क्षिपेत् ।।
अधोऽग्निं ज्वालयेदेतत् तुलायन्त्रमुदाहृतम् । (R. Cū. 5/64-66)

Two even sized 'vṛntāka mūṣā' (brinjol shaped crucibles) are taken. At the neck of both these crucibles, a hole is made on one side and a thin 'metal pipe' (stainless steel pipe) of required length is fixed. The pipe connecting place and the pipe's outer surface is properly smeared with wet mud and dried.

Now, in one crucible, 'śuddha gandhaka' and in another 'śuddha pārada' are

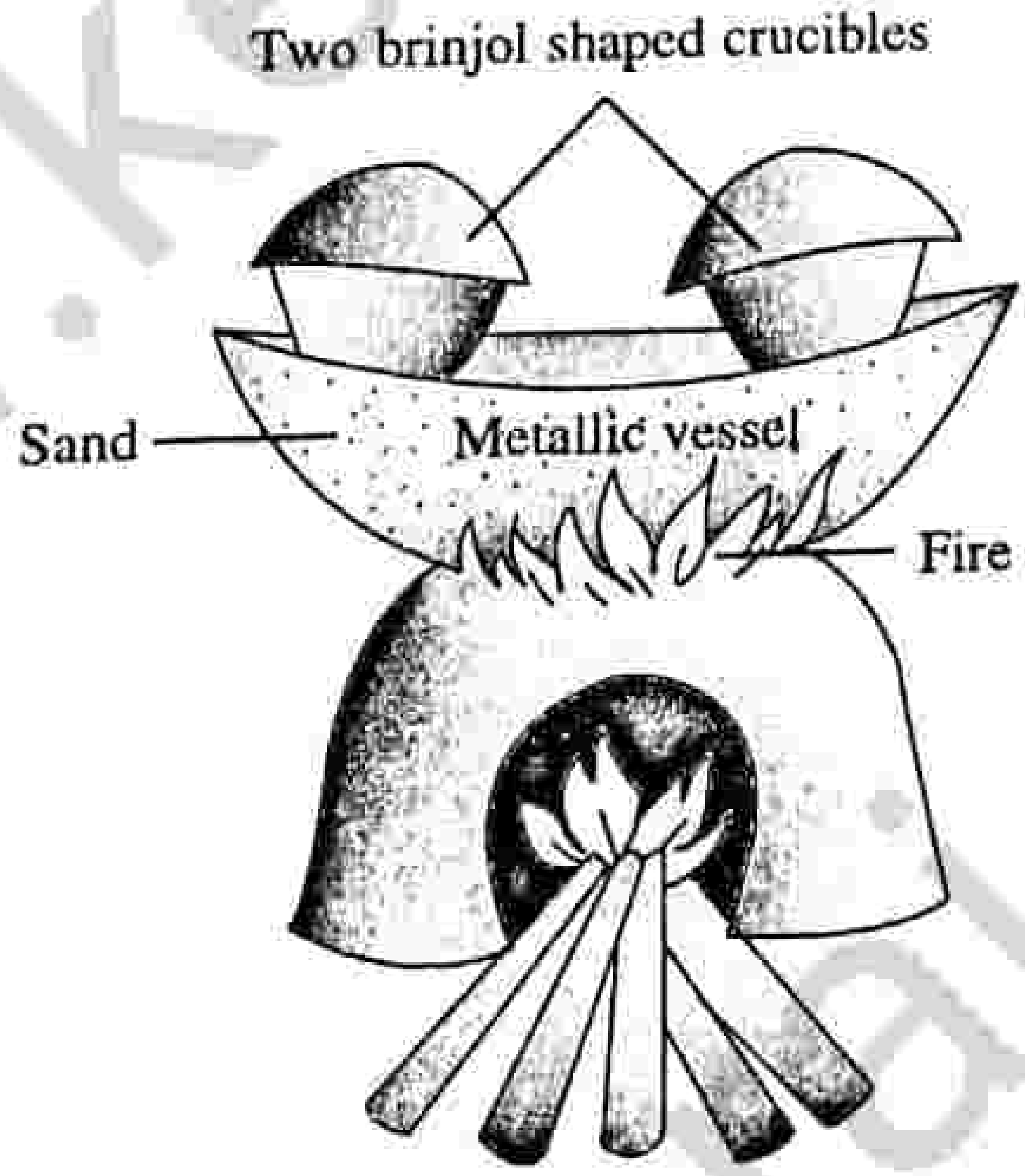


**Fig. : Tulā yantra**

put in desired ratios and the 'vṛntāka mūṣā' are closed with their lids, sealed with wet mud and dried.

Since the shape of this apparatus prepared appears like that of the physical balance, it is called as 'tulā yantra'. Later this entire apparatus is placed in a 'vālukā yantra' and subjected for intense heat.

Here the vapours of 'śuddha gandhaka' travel through the pipe into another crucible containing 'śuddha pārada' and will be digested in it. This yantra in olden days was used for the purpose of 'gandhaka jāraṇa'.

Note: Presently the word 'tulā yantra' indicates the physical balance meant for physical quantity measurement of different drugs. More advanced physical balances; electronic balances are available now for the purpose.

### 9. Dolā-yantra:

द्रवद्रव्येण भाण्डस्य पूरितार्धोदकस्य च । मुखस्योभयतो द्वारद्वयं कृत्वा प्रयत्नतः ॥
तयोस्तु निक्षिपेद्दण्डं तन्मध्ये रसपोट्टलीम् । बद्ध्वा तु स्वेदयेदेतद्दोलायन्त्रमिति स्मृतम् ॥

(R. R. S. 9/3-4)

Dolāyantra is a conventional apparatus used for swedana of medicinal drugs (pārada, swarṇa mākṣika, śilājatu, guggulu etc) as a part of their purification. To construct this 'dolāyantra', a clean and strong mud pot or any wide mouthed metallic container of desired size is selected. At its neck, two holes are made from one side to the other and a thin rod is inserted through these holes.

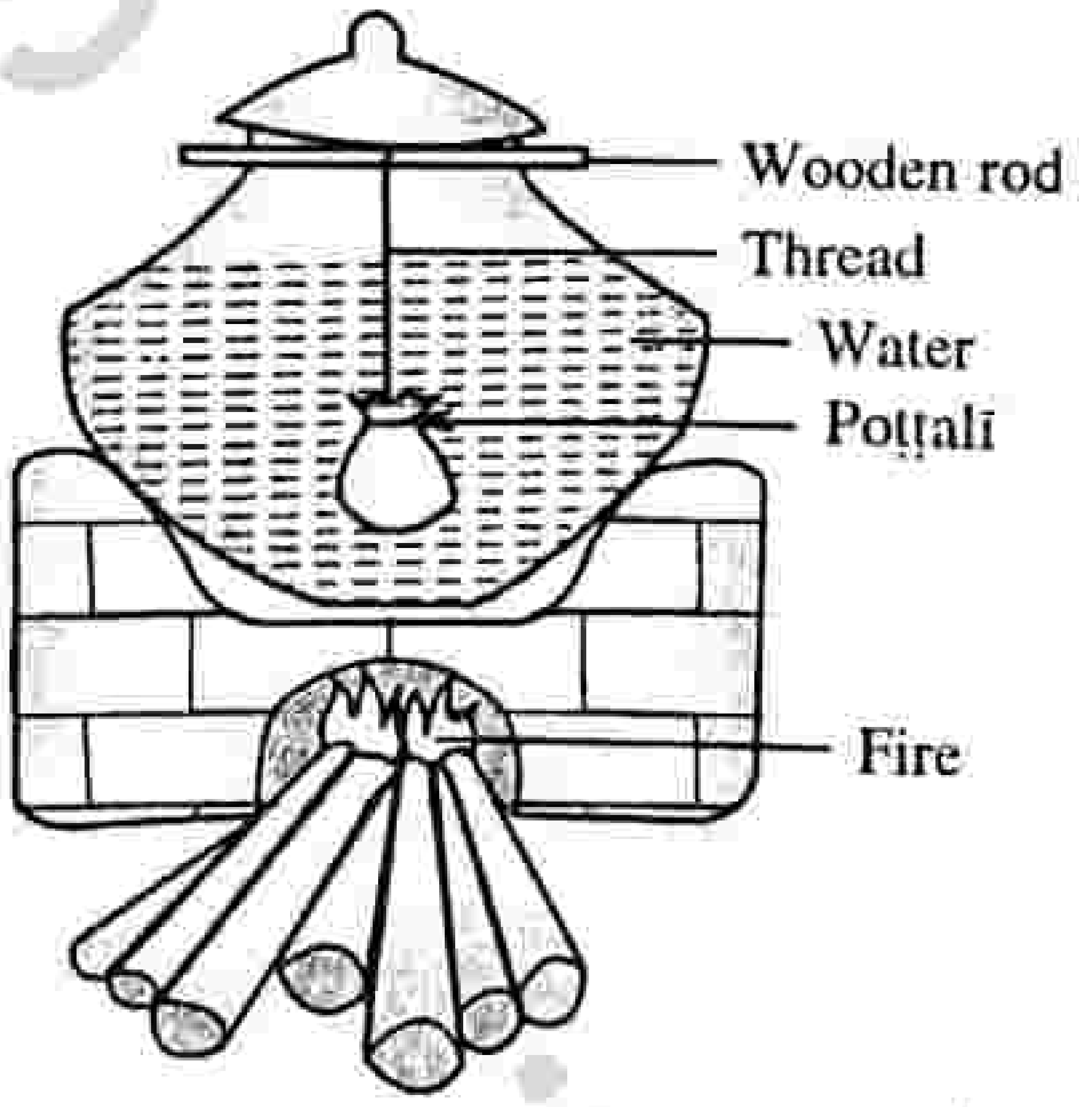


Fig. : Dolā yantra

The pot is now filled with the liquid specified for swedana (godugdha, kāñjī, triphalā kwātha etc) up to the required level. Meanwhile, the medicinal drug is tied in a clean, white triple folded cloth like a 'poṭṭalī' with a strong and long thread. It is now hung into this liquid by tying its thread at the midpoint of the rod.

Here one should see that the poṭṭalī neither touches the bottom of the pot nor it remains above the liquid level. The pot is now carefully placed over mild fire and heated. As the liquid inside the pot starts boiling, the drug material undergoes swedana.

While boiling, as the liquid level goes down, the length of the poṭṭalī thread has to be increased little by little, so that the poṭṭalī stays completely immersed in the liquid. The process of swedana should be continued for specified time.

The apparatus of this type is called as 'dolāyantra'. This apparatus is used especially for swedana of many medicinal drugs.

Note: If pārada is to be subjected for swedana in dolāyantra, its poṭṭalī has to be tied with a layer of 'bhojapatra' (Betula utilis) and thick cloth. For better swedana of the drug, some people close the mouth of the pot during the process.

### 10. Ḍamaruka yantra:

स्थालिकोपरि विन्यस्य स्थालीं न्युब्जतयापराम् । पचेद्यथाक्रमं त्वेतद्यन्त्रं डमरुकाह्वयम् ॥
(R. T. 4/41)

- Another reference:

यन्त्रस्थाल्युपरि स्थालीं न्युब्जां दत्त्वा निरुन्धयेत् । यन्त्रं डमरुकाख्यं तद्रसभस्मकृते हितम् ॥
(R. R. S. 9/57)

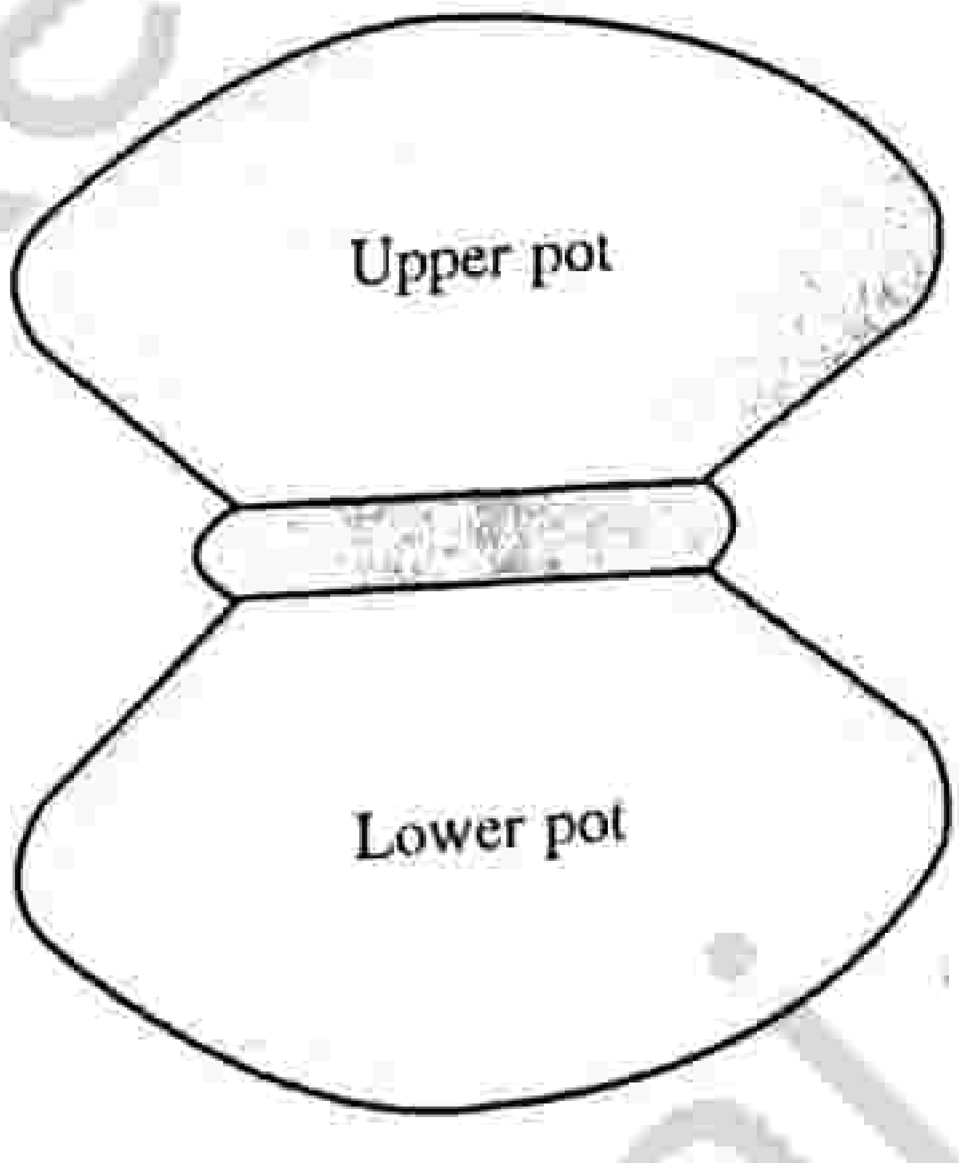


Fig. : Ḍamaruka yantra

To construct 'ḍamaruka yantra', two vessels of similar size are selected. One vessel is placed upright and is filled with the medicinal drugs to be processed. Over it, the second vessel is placed inverted and the mouth of both the vessels is sealed using wet cloth smeared with mud.

Later the vessel is placed over fire and heat is applied for desired period. This type of yantra is called as 'ḍamaru yantra' or 'ḍamaruka yantra'. This is used for 'ūrdhwa-pātana' of 'pārada', 'gourīpāṣāṇa' etc.

Note: This yantra is similar as that of 'ūrdhwa pātana yantra'. Here also a wet cloth is placed and frequently replaced with the fresh one over the base of the inverted upper pot.

### 11. Vidyādhara yantra:

> स्थालिकोपरी विन्यस्य स्थालीं सम्यङ्निरुध्य च । ऊर्ध्वस्थाल्यां जलं क्षिप्त्वा वह्निं प्रज्वालयेदधः।।
> एतद्विद्याधरं यन्त्रं हिङ्गुलाकृष्टिहेतवे ।। (R. R. S. 9/56)

Two mud pots of even size are taken. In one mud pot, the 'śuddha hiṅgula' is taken. Another mud pot is placed upright on the earlier mud pot and the joining part of both the parts is properly sealed with wet mud and dried.

Now the apparatus is carefully placed over fire and now the upper pot is filled with cold water. With intense heat, the 'mercury' from 'hiṅgula' rises up and adheres at the base of the upper pot in droplet form.

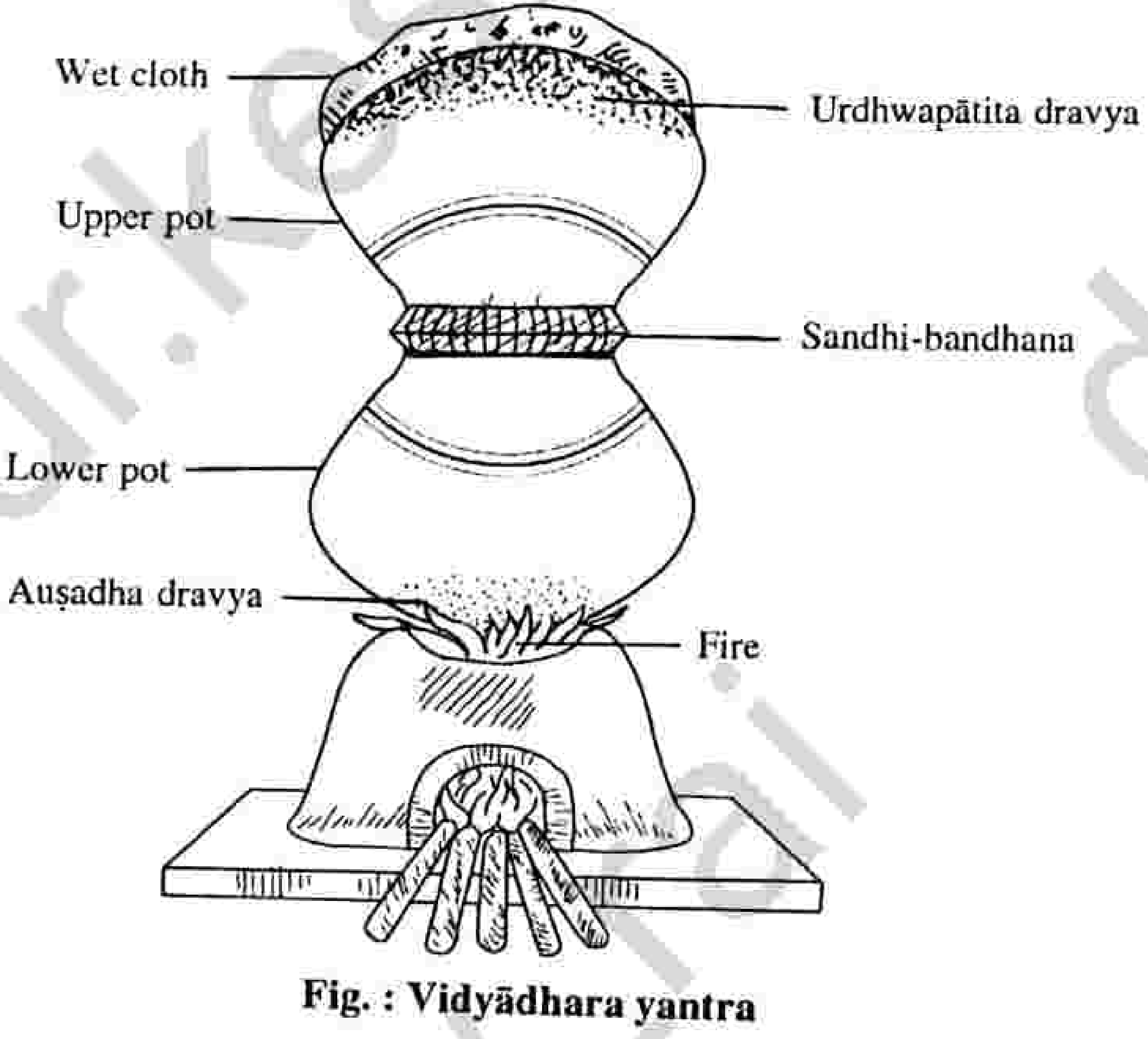


Fig. : Vidyādhara yantra

dr.keshav.raj

Later when cool on its own, the free mercury is collected and used as 'hiṅgulottha pārada', which is considered as purified mercury for further pharmaceutical use. This apparatus is called as 'vidyādhara yantra' and is used for extraction of 'pure mercury' (śuddha pārada) from 'cinnabar' (hiṅgula).

### 12. Pātāla yantra:

भूमौ हस्तमितं निम्नं विदद्याद् गर्तमुत्तमम् । तस्मिन् पातं निधायाथ तद्रूपं पात्रमन्यकम् ।।
आददीत ततस्तस्मिन्नौषधानि निधापयेत् । आस्यमस्य शरावेण छिद्रगर्भेण रोधयेत् ।।
पात्रमेतत्तु गर्तस्थे पात्रे यत्नेन विन्यसेत् । विदध्यादनयोर्यत्नात् सुदृढं सन्धिबन्धनम् ।।
मृदा सम्पूर्य गर्तन्तु वह्निं दद्यात् प्रयोगवित् । स्वाङ्गशीतं ततो ज्ञात्वा रसतन्त्रविचक्षणः ।।
उपपरिस्थन्तु वै पात्रं शनैः समवतारयेत् । अधःपात्रगतं तैलं गृह्णीयात्तु विधानतः ।।
एतद् बुधैः समाख्यातं यन्त्रं पातालसंज्ञकम् । आहर्तुं गन्धकादीनां तैलमेतत्प्रयुज्यते ।। (R. T. 4/52)

To construct 'pātāla yantra', a wider cylindrical pit measuring one hasta (18 inches) height is made. It is better to cover the walls of the pit with brick and cement, so that the mud does not slip in. At the base of the pit, an open vessel is placed.

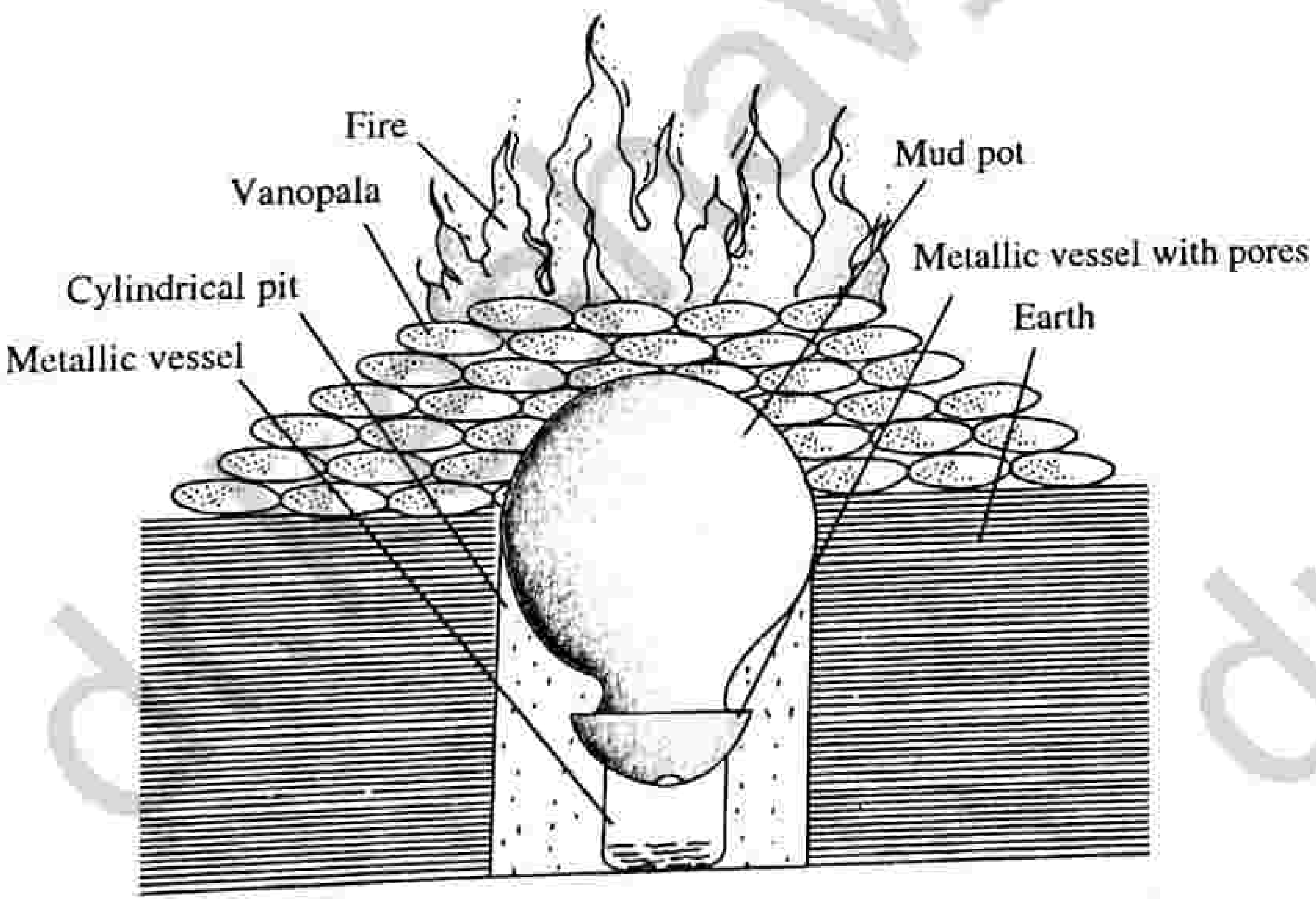


**Fig. : Pātāla yantra**

Now a metallic vessel of suitable size is selected. It is cleaned and its base is made porous by making many small sized holes at the base. This vessel is now filled with the medicinal drug and placed upright at the mouth of another metallic vessel placed at the base of the pit. This vessel is placed above with a inverted wide mouthed mud pot as shown in the picture and its base is sealed to the edges of the pit.

Now the required number of dry cow dung cakes are heaped around the vessel on the ground and ignited. As the heating process goes on, the oil from the drug inside trickles down through the pores and gets collected in the open vessel placed inside the pit. When cool on its own, the upper vessel is carefully removed and the inner open vessel is taken out to collect the oil inside.

This yantra is called as 'pātāla yantra'. It is used to extract oil from herbal drugs. 'bhallātaka taila pātana', 'karañja taila pātana' etc are done.

### 13. Pālikā yantra:

चषकं वर्तुलं लौहं विनताग्रोर्ध्वदण्डकम् । एतद्धि पालिकायन्त्रं बलिजारणहेतवे ।।

(R. R. S. 9/50)

- Another reference:

एतदेव हि यन्त्रन्तु नतहस्तकसंयुतम् । पालिकायन्त्रमुद्दिष्टं रसतन्त्रविचक्षणैः ।।

(R. T. 4/40)

Pālikā yantra is also like a simple tablespoon used in kitchens but its handle should be longitudinal with a bend at the top as shown in the figure. This yantra is used to take out oil or any other liquids from the vessels. It is also used for 'gandhaka jāraṇa' and in other pharmaceutical procedures.

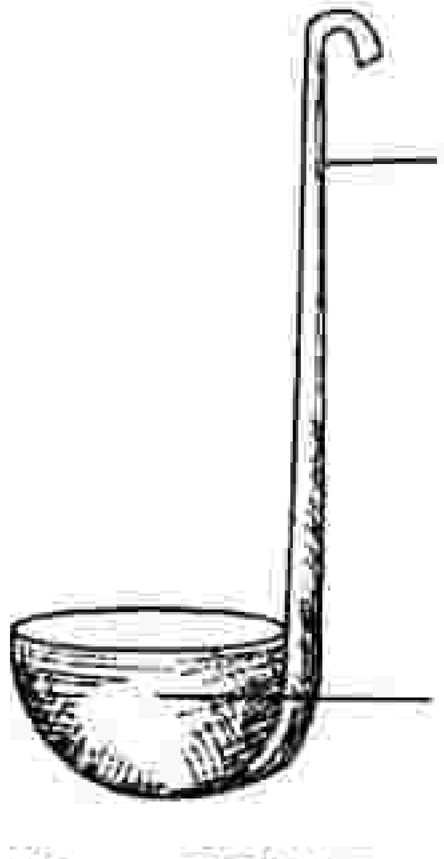


Fig. : Pālikā yantra

### 14. Puṭa yantra:

पुटनीयं तु कुम्भादौ विन्यस्यावृणुयात् पुनः । पिधानेन दृढेनाथ विदध्यात्सन्धिबन्धनम् ।।
करीषाग्नौ चुल्लिकायां वा पचेदग्निमानवित् । लोहादीनां मारणार्थं पुटयन्त्रं प्रशस्यते ।।

(R. T. 4/33-34)

- Another reference:

शरावसम्पुटान्तस्थं करीषेष्वग्निमानवित् । पचेच्चुल्ल्यां द्वियामं वा रसं तत्पुटयन्त्रकम् ।।

(R. R. S. 9/42)

The medicinal drug that needs application of heat is filled into a suitable strong vessel of desired size and shape or a śarāva sampuṭa. The mouth of the vessel is closed and sealed with wet cloth smeared with mud. Later this vessel is placed over oven (cullikā) or bhaṭṭī (fire of dry cow dung cakes) to apply desired heat. This type of yantra is called as 'puṭa yantra'. It is usually used to apply heat (give puṭa) to loha, abhraka and such other drugs.

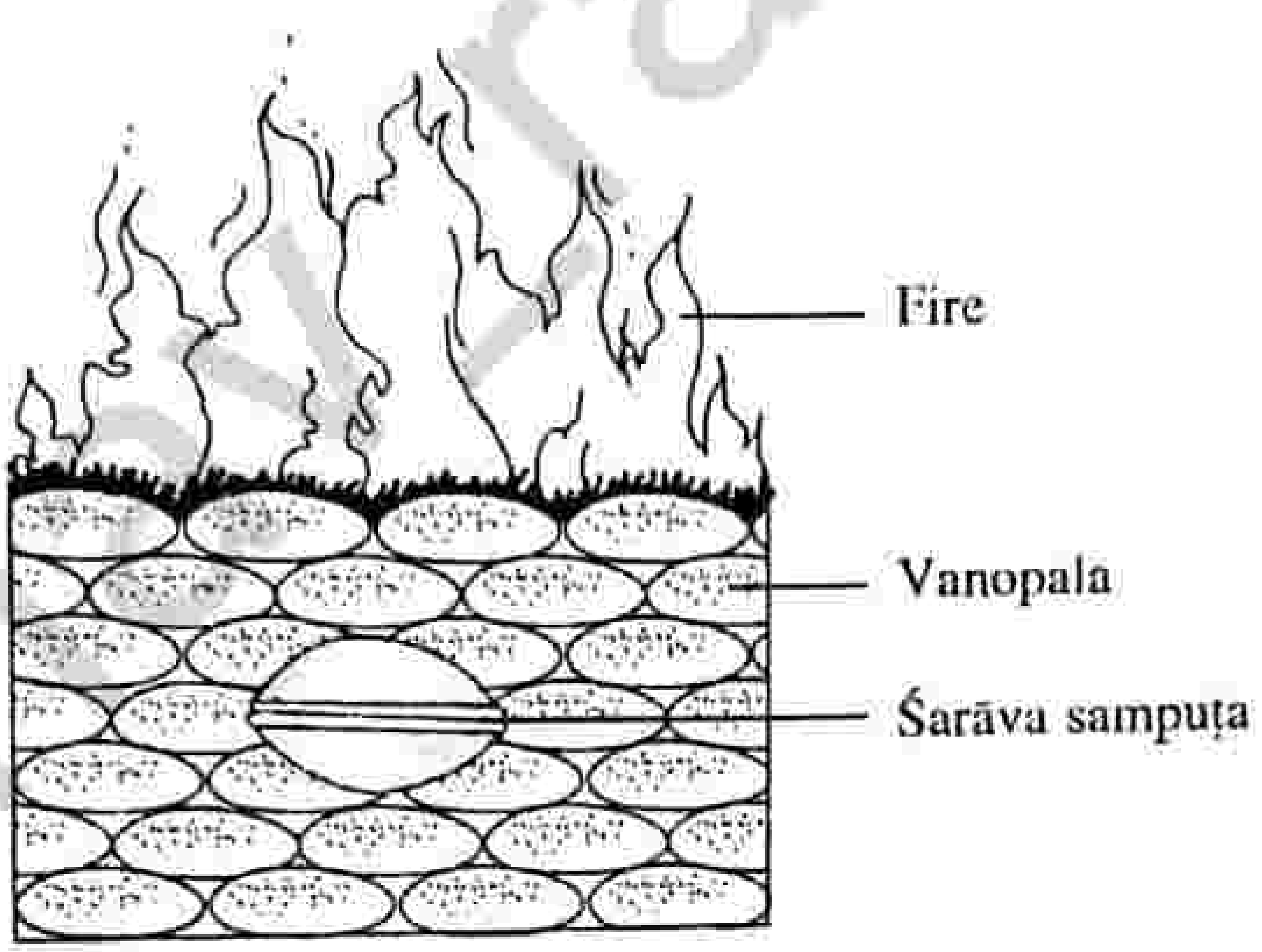


Fig. : Puṭa yantra

### 15. Vālukā yantra:

सवस्त्रकुट्टितमृदा लिप्ताङ्गीञ्च विशोषिताम् । रसादिपूर्णजठारां काचकूपीन्तु विन्यसेत् ।। २९ ।।
स्थाल्यां मृत्तललिप्तायां सुदृढायां प्रयत्नतः । आकण्ठं कूपिकां तत्र वालुकाभिः प्रपूरयेत् ।। ३० ।।
भाण्डाधो ज्वालयेदग्निं यथाकालं यथाक्रमम् । एतद् बुधैः समाख्यातं वालुकायन्त्रसंज्ञकम् ।।
(R. T. 4/29-31)

To construct 'vālukā yantra', a glass bottle (kāca kūpī), which is lengthy with elongated neck, which has round and firm base with amber colour is selected (beer bottle of 650 ml capacity suits better for the purpose). It is covered with 7 layers of wet cloth smeared with mud and dried as explained in books (mṛt-kapaṭita). One third of the bottle is filled with 'pārada' and other required drugs and kept ready.

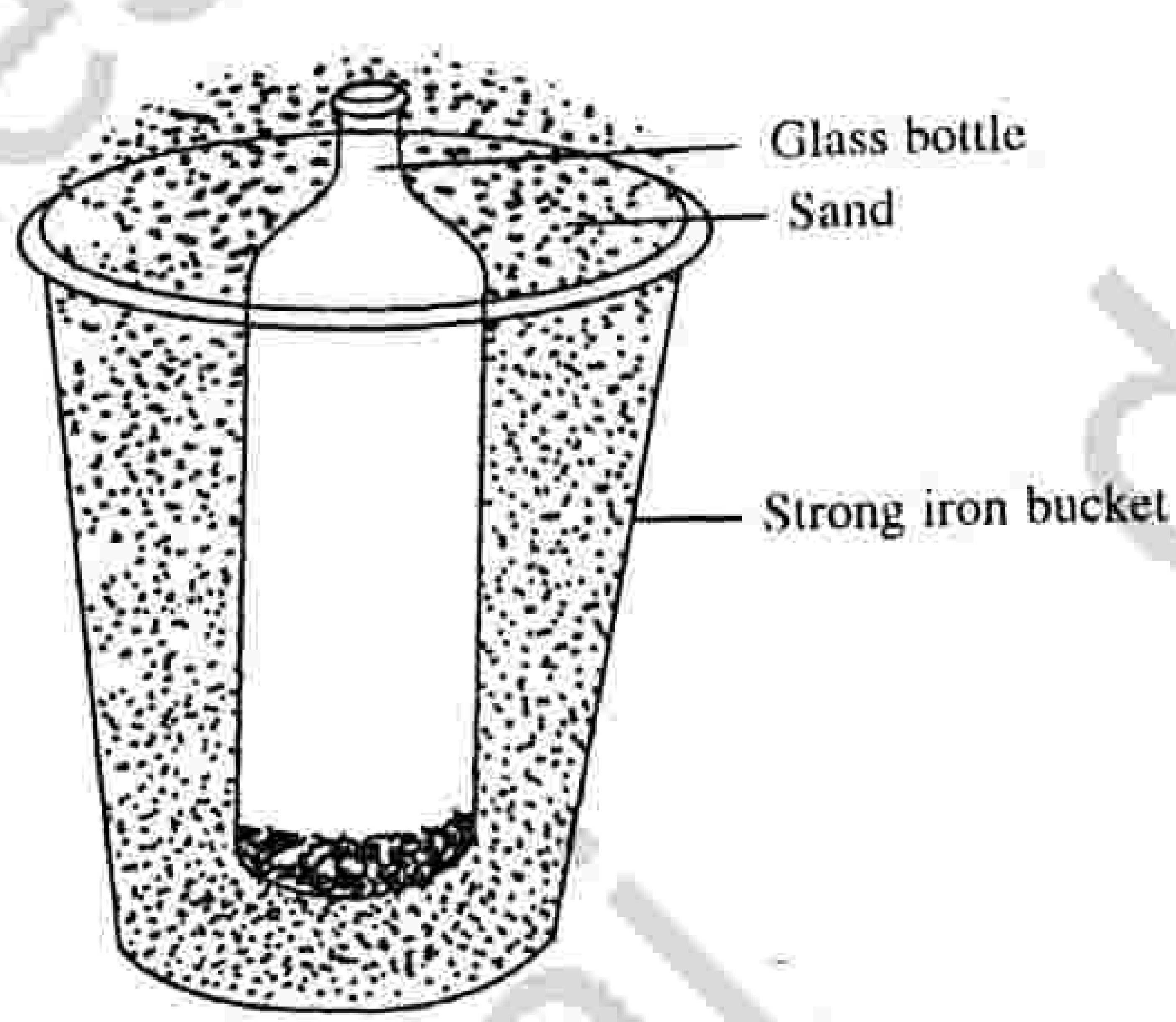


Fig. : Vālukā yantra

Now, a 12 aṅgula deep and wide, strong iron 'cylindrical bucket' like vessel is taken. On its outer surface, 2 to 3 layers of wet mud and cloth is put. At the base of this vessel 2 aṅgula, dry and clean sand is put. Over this, the earlier prepared bottle is firmly placed at the centre of the vessel. Later on all sides of the bottle, the sand is carefully filled up to its neck level.

Now the vessel is carefully placed over 'bhaṭṭī' (oven) and the heat of required intensity is applied for stipulated time. This type of yantra is called as 'vālukā yantra'. This is used for preparation of majority of 'kūpīpakwa rasāyana'.

### 16. Lavaṇa yantra:

लवणस्य च निक्षेपादेवं लवणयन्त्रकम् । प्रकीर्तितं भिषग्वर्यैर्मृगाङ्कादिरसार्थकम् ।। (R. T. 4/32)

Lavaṇa yantra is the same 'vālukā yantra' explained above. The only change here in 'lavaṇa yantra' is, instead of 'vālukā' (sand), 'lavaṇa' (salt) is filled around the bottle in the cylindrical iron vessel. All the procedure of heat application is also same. This is used for preparation of 'mṛgāṅka rasa' and such other preparations.

Note: If 'bhasma' of any dry wood is filled in place of 'vālukā' or 'lavaṇa' in the above yantra, it will be called as **'Bhasma yantra'**.

### 17. Bhūdhara yantra:

वालुकाचितसर्वाङ्गां कुमुदीं कुण्डगां पचेत् । आच्छाद्य दीप्तैरुपलैर्यन्त्रं भूधरसंज्ञकम् ।।

(R. T. 4/21)

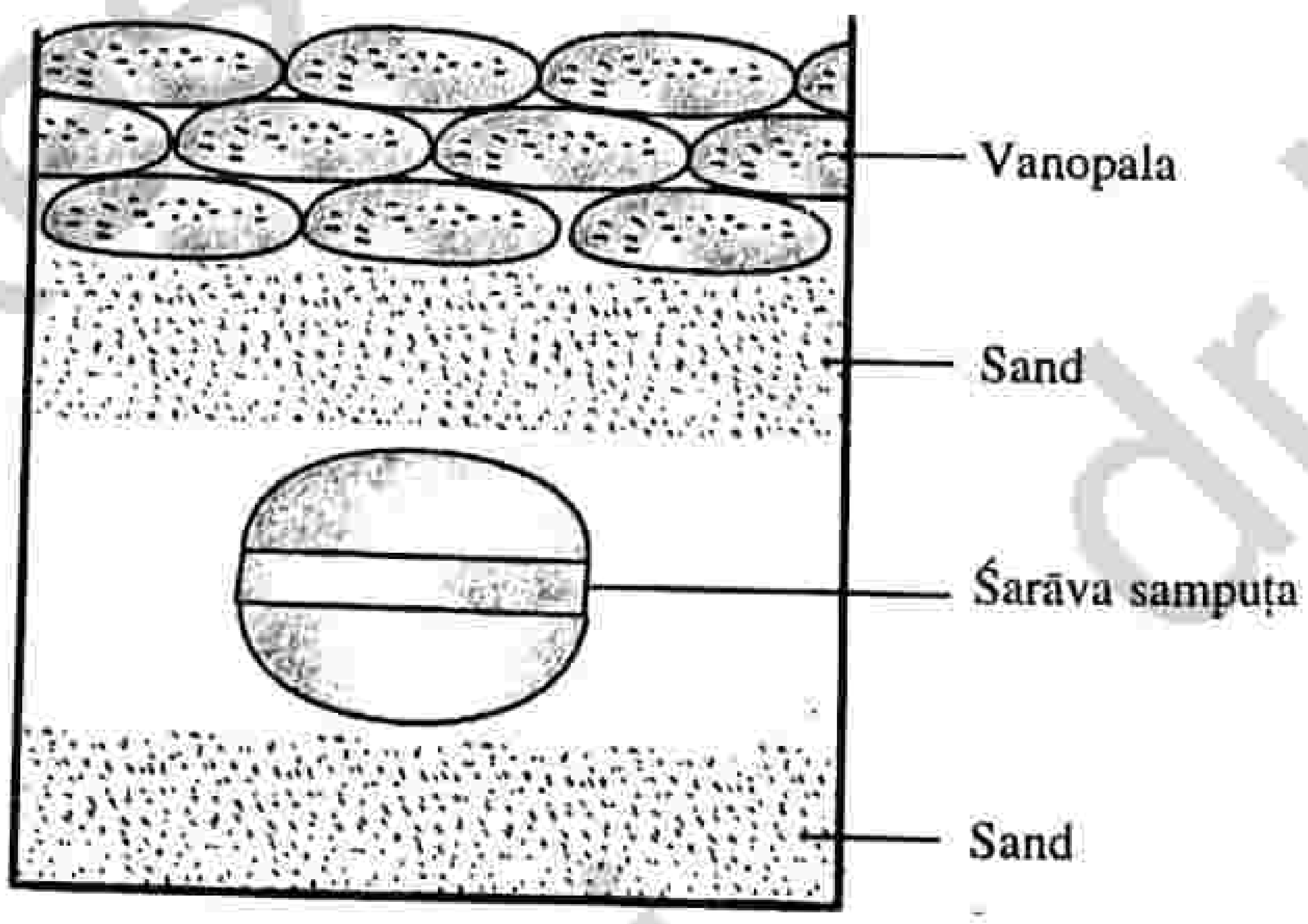


**Fig. : Bhūdhara yantra**

A wide and circular earthen vessel of cylindrical bucket like structure is selected. At its base, two aṅgula sand (vālukā) is spread. Above that, the tightly enclosed and sealed crucible containing medicine is firmly placed. Above and on all sides of the crucible, two-aṅgula thick sand is filled. Above this sand, the specified number of dry cow dung cakes are placed and ignited. This is called 'bhūdhara yantra'.

Note: Instead of using an earthen vessel, similar sized 'pit' may be done in the ground and the same remaining procedure may be carried out. If done so, the name 'bhūdhara yantra' suits better to this yantra.

### 18. Sthālī yantra:

स्थाल्यां संस्थाप्य लोहादि मल्लेनावृणुयान्मुखम्। स्थाल्यधोज्वालयेदग्निं स्थालीयन्त्रमिदं स्मृतम्।।

(R. T. 4/28)

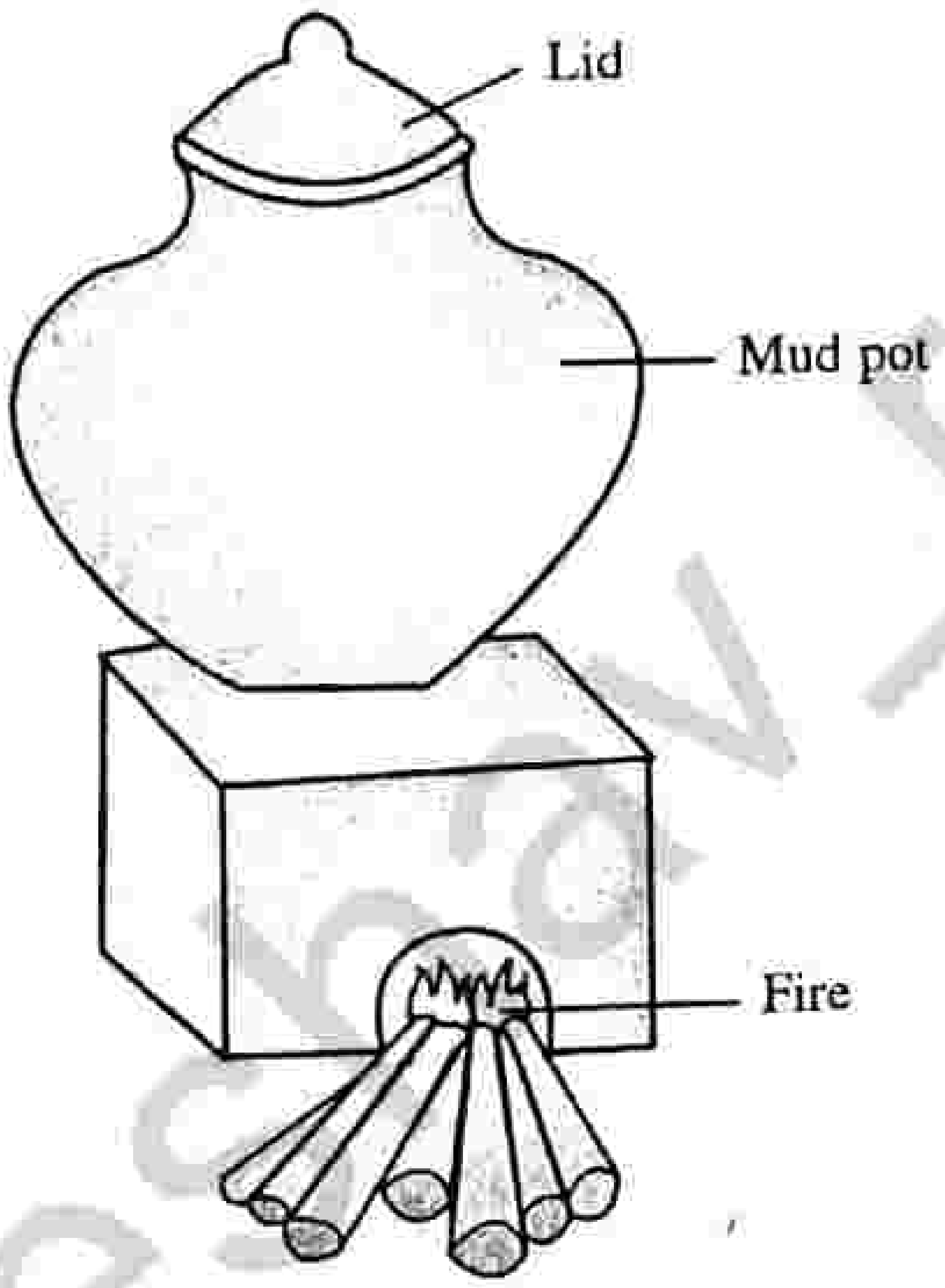


**Fig. : Sthālī yantra**

In any earthen or metallic vessel, the metallic and mineral drugs are filled with specified 'amla dravya'. The mouth of the vessel is closed and sealed with a suitable lid. The vessel is placed over fire and the contents are cooked up to the stipulated time. This type of yantra is called as 'sthālī yantra'.

### 19. Swedanī yantra:

साम्बुस्थालीमुखेबद्ध वस्त्रे पाक्यं निवेशयेत् । पिधाय पच्यते यत्र स्वेदनीयन्त्रमुच्यते ।।

(R. R. S. 9/5)

A wide mouthed mud pot is selected. It is filled with required quantity of water and firmly placed over fire. The mouth of the vessel is tied with a clean cotton cloth. Over this cloth, the drug that requires 'swedana' is placed and the heating process is continued.

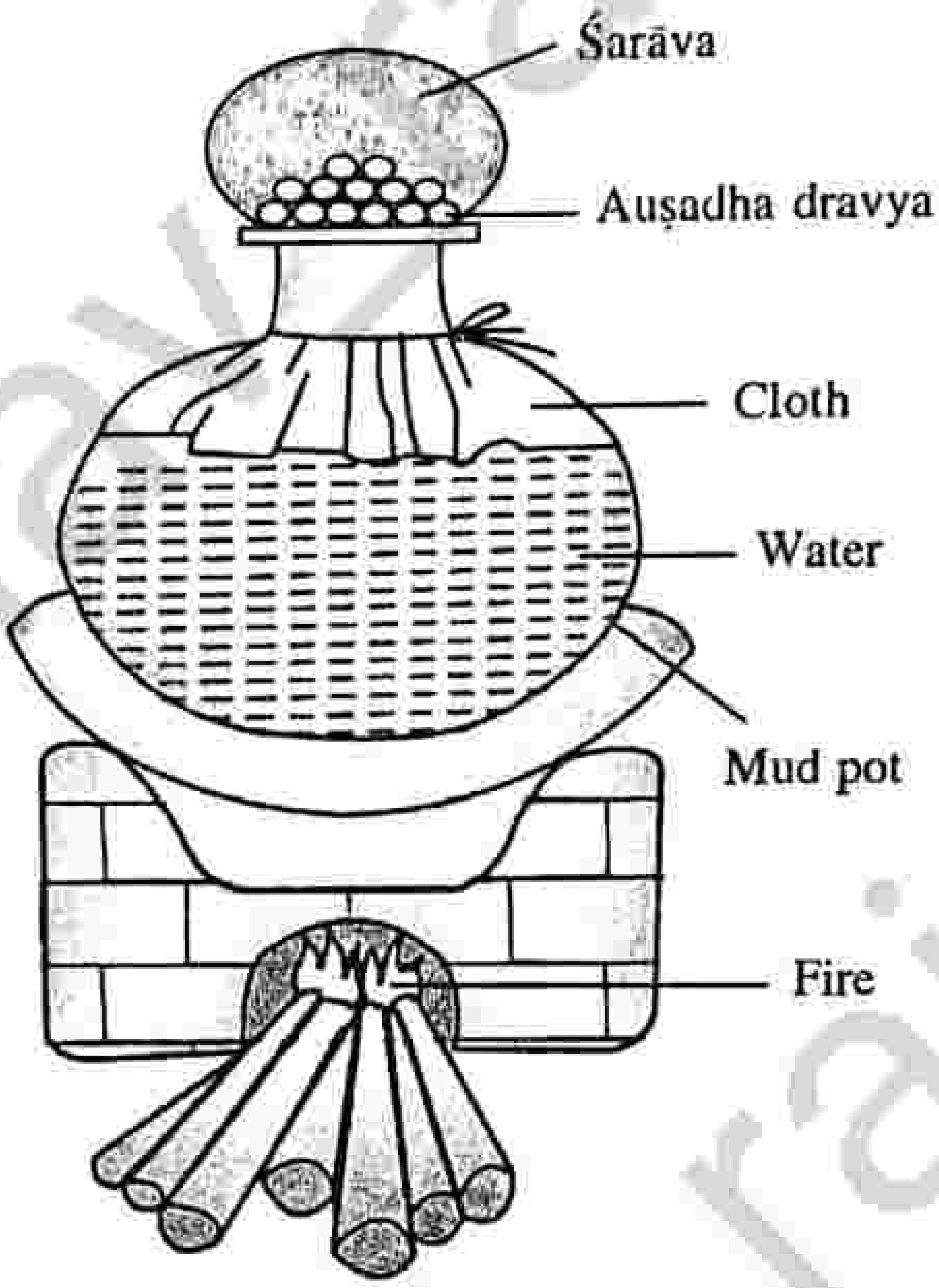


Fig. : Swedanī yantra

The drug material on the cloth is exposed to the hot water vapours produced in the pot. Because of which, the drug material is subjected for swedana. This apparatus is called as 'swedanī yantra'.

### 20. Darvikā yantra:

चषकं दर्विकाकल्पं दीर्घहस्तकसंयुतम् । दर्विकायन्त्रमेतद्धि गन्धशोधनसाधकम् ।। (R. T. 4/39)

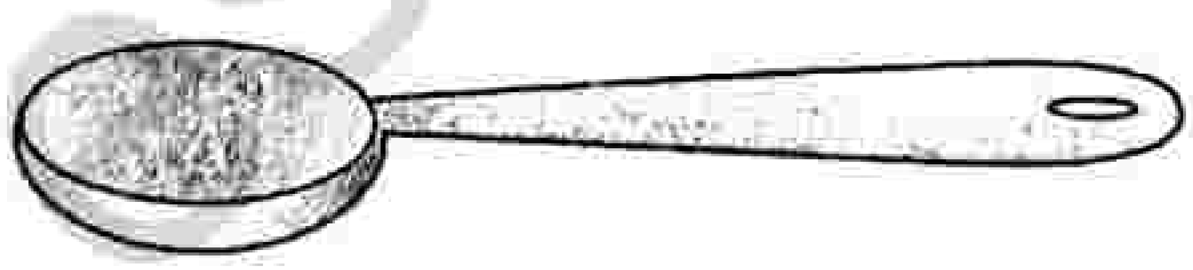


Fig. : Darvikā yantra

Darvikā yantra is a simple tablespoon used in kitchens but of the bigger size. The spoon should be made of iron or steel. Its head should have a strong, deeper bowl like structure. Its handle should be strong and long (1 to 1.5 hasta or 18 to 27 inches). It is used for melting 'gandhaka', 'nāga', 'vaṅga' etc, during their purification procedures.

### 21. Ghaṭa yantra or Āpyāyanaka yantra:

चतुष्प्रस्थजलाधारश्चतुरङ्गुलिकाऽऽननः । घटयन्त्रमिदं प्रोक्तं तदाप्यायनकं स्मृतम् ।।

(R. R. S. 9/51)

A pot with capacity of 'four prastha' (3 lts) of water and which has neck of 4 aṅgula circumference, is called as 'ghaṭa yantra' or 'āpyāyanaka yantra'.

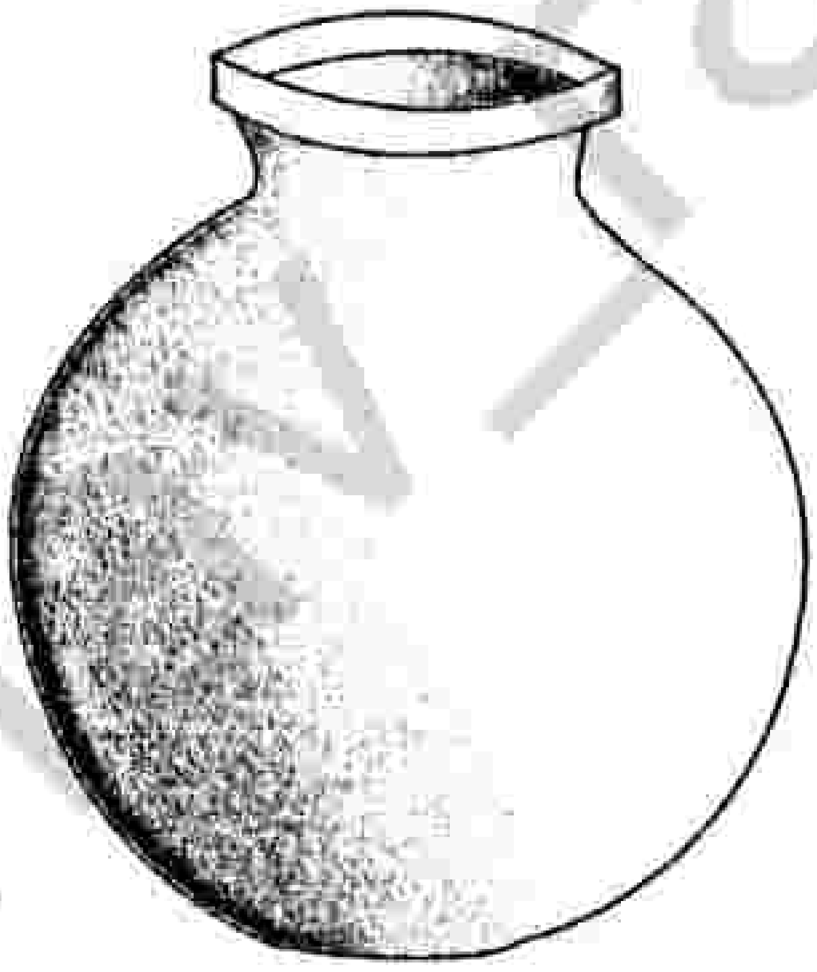


Fig. : Ghaṭa yantra

Note: Any mud or metal pot used in the pharmaceutical procedures may be termed as a 'ghaṭa yantra'.

**22. Electric and scientific weighing balance:**

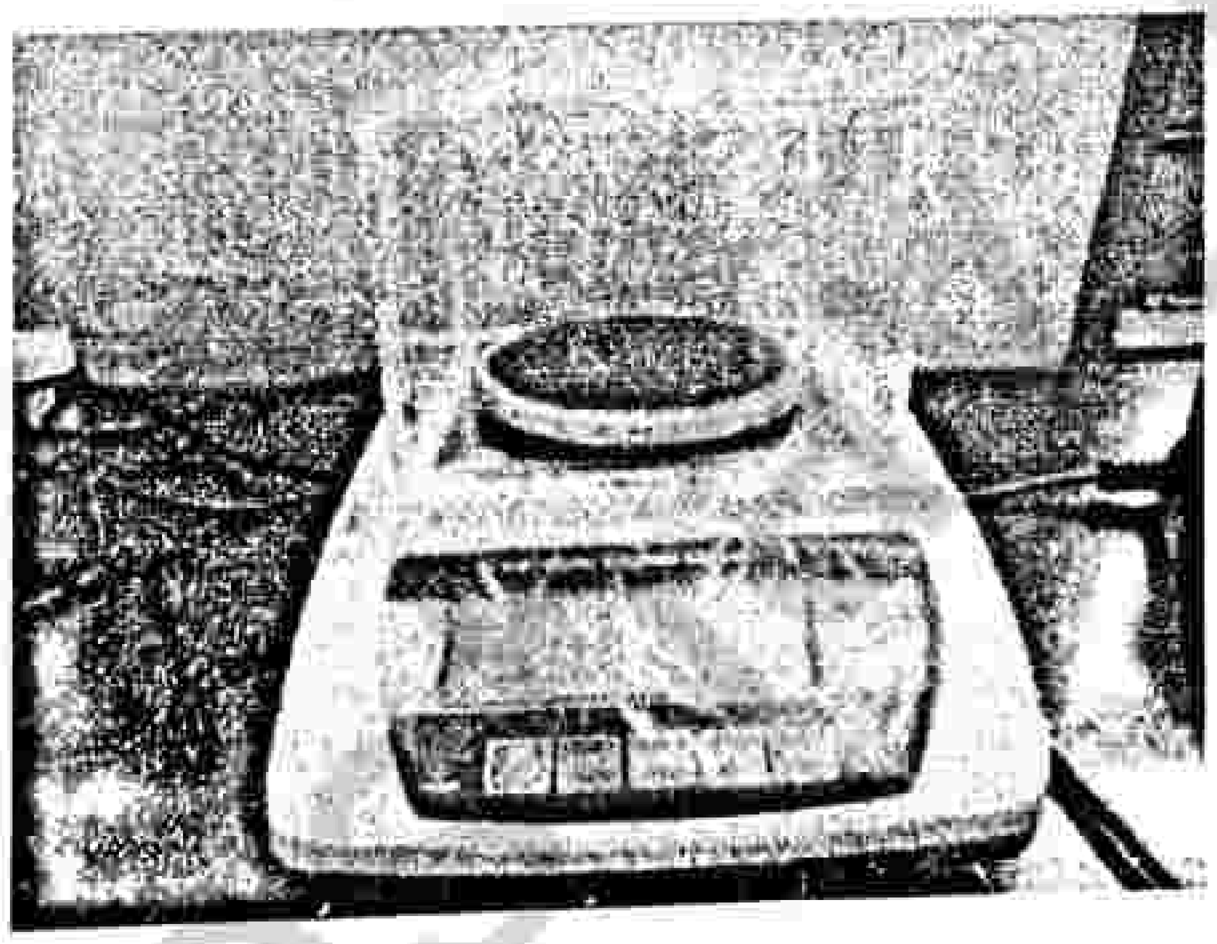


Fig. : Electronic precision balance

❄

## Chapter 6
# MŪṢĀ
## (Crucibles)

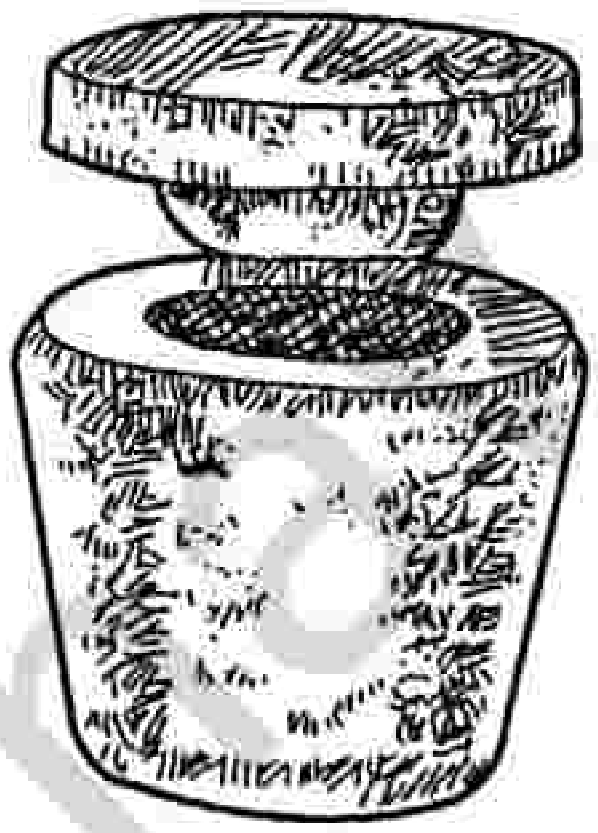
**Mūṣā- definition:**

मुष्णाति दोषान् मूषेयान् सा मूषेति निगद्यते ।। (R. R. S. 10/2)

- Other reference:

मुष्णाति दोषान् यस्मात्सा तस्मान्मूषा प्रकीर्तिता । (R. T. 3/2)

A crucible that eradicates the doṣas (*muṣṇāti doṣān*) of the drugs subjected for heat in it is called as 'mūṣā'. The crucible here is a strong mud container in which, metals or minerals can be melted or heated up to a very high temperature.



**Mūṣā- synonyms:**

मूषा हि क्रौञ्चिका प्रोक्ता कुमुदी करहाटिका । पाचनी वह्निमित्रा च रसवादिभिरीर्यते ।।
मुष्णाति दोषान्मूषा या सा मूषेति निगद्यते । (R. R. S. 10/1-2)

A 'mūṣā' has the following words used synonymously in the classics;

| Mūṣā synonyms | Called so since... |
|---|---|
| Kumudī | The shape of the 'mūṣā' resembles the shape of lotus flower (kumuda); |
| Krouñcikā | The mud used for preparation of 'mūṣā' is taken from the places called krouñcikā and karahāṭikā; |
| Karahāṭikā | |
| Vahnimitra | The 'mūṣā' can withstand any degree of temperature required for pharmaceutical purposes; |
| Pācanī | The metals and minerals are cooked in it; |

**Crucibles- general information:**

A **crucible** is a container that can withstand very high temperatures and is used for metal, glass, and pigment production as well as a number of modern laboratory processes. While crucibles historically were made from clay, they can be made from any material that withstands temperatures high enough to melt or otherwise alter its contents.

Crucible materials and description: Crucibles and their covers are made of high temperature-resistant materials, usually porcelain or an inert metal. One of the earliest uses of platinum was to make crucibles. Ceramics such as alumina, zirconia, and especially magnesia will tolerate the highest temperatures. More recently, metals such as nickel and zirconium have been used. The lids are typically loose-fitting to allow gases to escape during heating of a sample inside.

Crucibles and their lids can come in high form and low form shapes and in various sizes, but rather small 10-15 ml size porcelain crucibles are commonly used for gravimetric chemical analysis. These small size crucibles and their covers made of porcelain are quite cheap when sold in quantity to laboratories, and the crucibles are sometimes disposed of after use in precise quantitative chemical analysis. There is usually a large mark-up when they are sold individually in hobby shops.

Used to determine the percentage of ash: Ash is the completely unburnable in organic salts in a sample. A crucible can be similarly used to determine the percentage of ash contained in an otherwise burnable sample of material such as coal, wood or oil. A crucible and its lid are pre-weighed at constant mass as described above. The sample is added to the completely dry crucible and lid and together they are weighed to determine the mass of the sample by difference.

**Mūṣā preparation- basic requirements:**

उपादानं भवेत्तस्य मृत्तिका लोहमेव च । (R. R. S. 10/3)

The basic requirements to prepare any crucible are the 'suitable mud' and the 'iron powder'. Without these two materials, the crucibles cannot be made.

**Mūṣā- suitable mud:**

सशर्करा पाण्डुरा च वह्नितापसहा चिरम् । स्थूला च मृत्तिका या स्यात् मूषार्थं सा मतोत्तमा ।।
(R. T. 3/6)

The mud that is granular (saśarkarā), pale coloured (pāṇḍura) and the one that can with-stand any degree of temperature for a longer duration (vahnitāpasahā ciram) during pharmaceutical procedures; is the suitable mud for the preparation of crucibles.

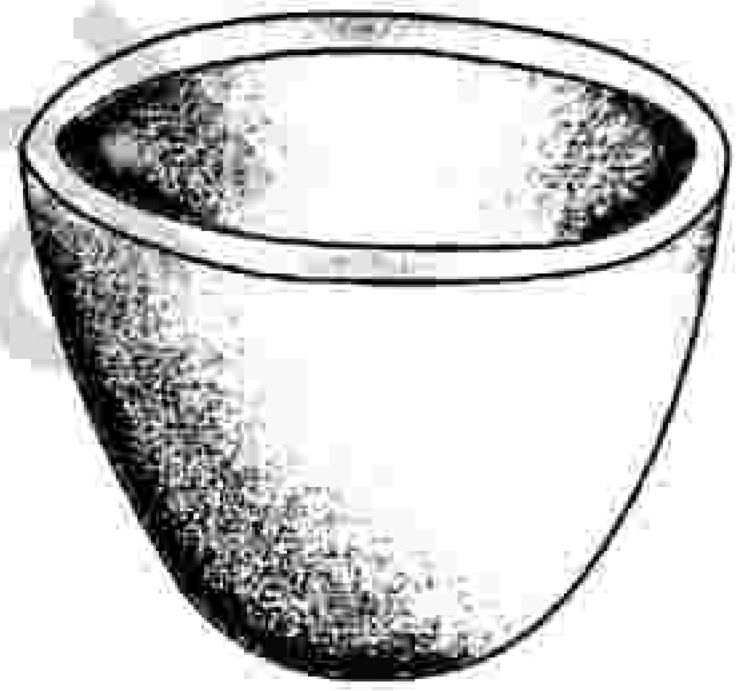
### 1. Sāmānya mūṣā:

शिखित्रकैर्दग्धतुषैः शणेन सलद्दिका दण्डसुकुट्टिता च ।
या मृत्तिका तद्विहिता तु मूषा सामान्यमूषा कथिता रसज्ञैः ।। (R. T. 3/7)

- Other reference:

या मृत्तिका दुग्धतुषैः शणेन शिखित्रकैर्वा हयलद्दिना च ।
लोहेन दण्डेन च कुट्टिता सा साधारणा स्यात्खलु मूषिकार्थे ।। (R. R. S. 10/7)

Equal quantities of 1. Charcoal (śikhitra) 2. Ash of husk (dagdha tuṣa) 3. Fibres of jute (śaṇa) and 4. Horseshit (laddikā); are pounded together along with same quantity of selected mud. The rigorous pounding yields a sticky and homogenous mixture. From this mixture, the crucibles of desired size and shape are prepared, dried and baked in intense heat. Later they are used as 'sāmānya mūṣā'.



Note: If no mūṣā is specified in the classics, the 'sāmānya mūṣā' may be readily used. Since no ratio is mentioned for all the above said ingredients, they are to be taken in equal quantities.

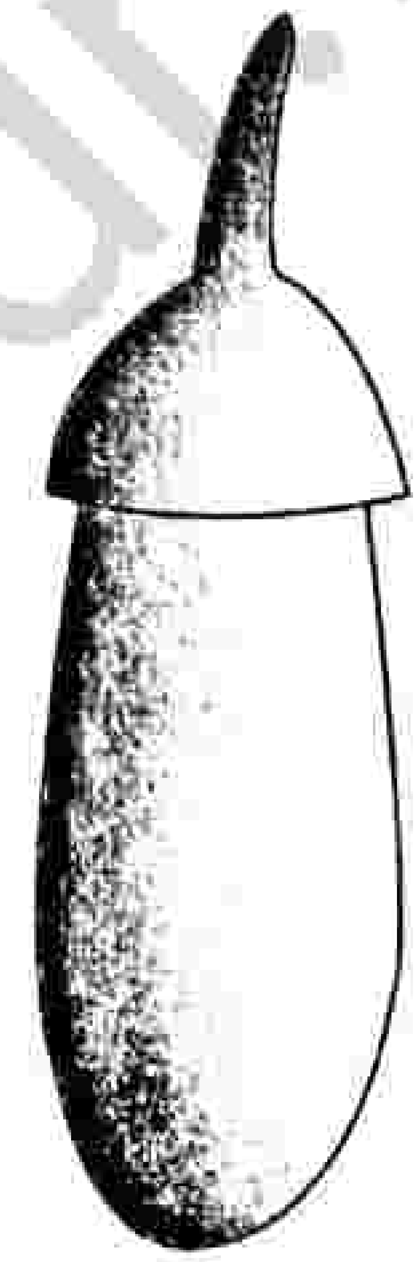
### 2. Gostanī mūṣā:

सापिधाना शिखोपेता गोस्तनाकारसन्निभा । सत्त्वद्रावणशुद्ध्यर्था सा मूषा गोस्तनोमता ।।
(R. T. 3/15)

- Other reference:

मूषा या गोस्तनाकारा शिखायुक्तपिधानका । सत्त्वानां द्रावणे शुद्धौ मूषा सा गोस्तनी भवेत् ।।
(R. R. S. 10/25)

The crucible prepared in the shape of 'gostana' (cow's udder shape) is called as 'gostana mūṣā'. Here the lid for this crucible is prepared in inverted cone shape (with wider base and tapering top). This crucible is used for sattva extraction of selected metals and minerals.



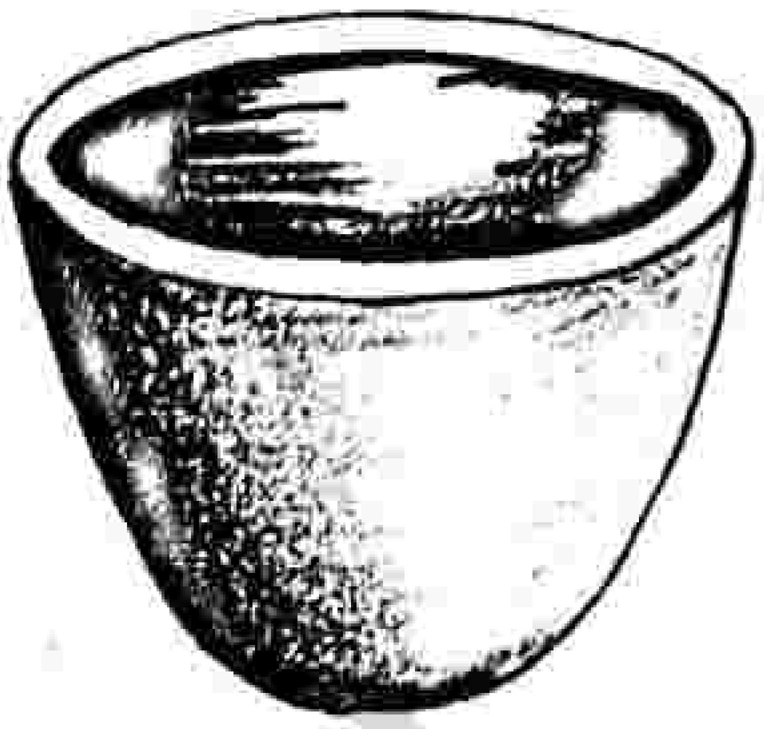
### 3. Vajra mūṣā:

मृदस्त्रिभागः शणलद्दिभागौ भागश्च निर्दग्धतुषोपलादेः ।
किट्टार्धभागं परिखण्ड्य वज्रमूषां विदध्यात् खलु सत्त्वपाते ।।
(R. R. S. 10/8)

- Other reference:

  त्रयो भागा मृदो द्वौ तु शणलद्दिकयोस्तथा । भागो दग्धतुषादेश्च किट्टस्य त्वर्धं एव च ।।
  एभिः कृता तु या मूषा वज्रमूषा तु सा मता । प्रयुज्यते विशेषेण सत्त्वपातनकर्मणि ।। (R. T. 3/8-9)

1. Selected mud- 3 parts; 2. Jute fibre- 1 part; 3. Horseshit- 1 part; 4. Ash of husk- 1 part; and 5. Maṇḍūra (loha kiṭṭa) - half part; all these are rigorously pounded together to obtain a sticky and homogenous mixture. From this mixture, the crucibles of desired size and shape are prepared, dried and baked in intense heat. Later they are used as 'vajra mūṣā'.



Since the strength and durability of this crucible is more, it is named as 'vajra mūṣā'. This crucible is prominently used for 'sattvapātana' of vajra (diamond), abhraka (mika) and other such harder metals and minerals.

Note: Some people consider 2 parts each of jute fibre and horseshit in the above ratio of drugs.

**4. Mahā mūṣā or Sthūla mūṣā:**

तले या कूर्पराकारा क्रमादुपरि विस्तृता ।
स्थूलवृन्ताकवत्स्थूला महामूषेत्यसौ स्मृता । सा चायोऽभ्रकसत्त्वादेः पुटाय द्रावणाय च ।।
(R. R. S. 10/29)

- Other reference:

  बर्तुला चिपिटामूले स्थूला चायामविस्तरा । विस्तृतास्या च या मूषा महामूषा तु सा मता ।।
  लोहाभ्रताप्यसत्त्वादेः पुटनार्थं भिषग्वरैः । प्रयुज्यते महामूषा स्थूलमूषा च सा स्मृता ।।
  (R. T. 3/17-18)

Crucible having a narrow and strong base at the bottom (to fix firmly in the ground) and with a wide and spacious body above, that has equal length and width. This crucible is also called as 'sthūla mūṣā'. It is used for application of 'puṭa' to the sattva of loha, abhraka, swarṇa mākṣika etc.

**5. Yoga mūṣā:**

दग्धाङ्गारतुषोपेता मृत्स्ना वल्मीकमृत्तिका । तत्तद्विडसमायुक्ता तत्तद्विडविलेपिता ।।
तया या विहिता मूषा योगमूषेति कथ्यते । अनया साधितः सूतो जायते गुणवत्तरः ।।
(R. R. S. 10/10-11)

- Other reference:

  तुषाद्यैश्च बिडाद्यैश्च कृता चापि विलेपिता । सूतसिद्धिकरी चैषा योगमूषा निगद्यते ।। (R. T. 3/10)

Equal quantities of 1. Ash of charcoal 2. Ash of husk 3. Ant hill mud 4. Viḍa (a special adhesive prepared using kṣāra dravya, amla dravya, gandhaka, mūtra etc—find the reference below); are rigorously pounded together to obtain a sticky and homogenous mixture.

From this mixture, the crucibles of desired size and shape are prepared, dried and baked in intense heat. Now the kalka of all the above quoted drugs is prepared and applied on all parts of the crucible and dried.

This process of kalka application and drying is repeated for 3 to 4 times and later the crucible is used as 'yoga mūṣā'. This crucible is prominently used for 'pārada māraṇa'.

**Viḍa:**

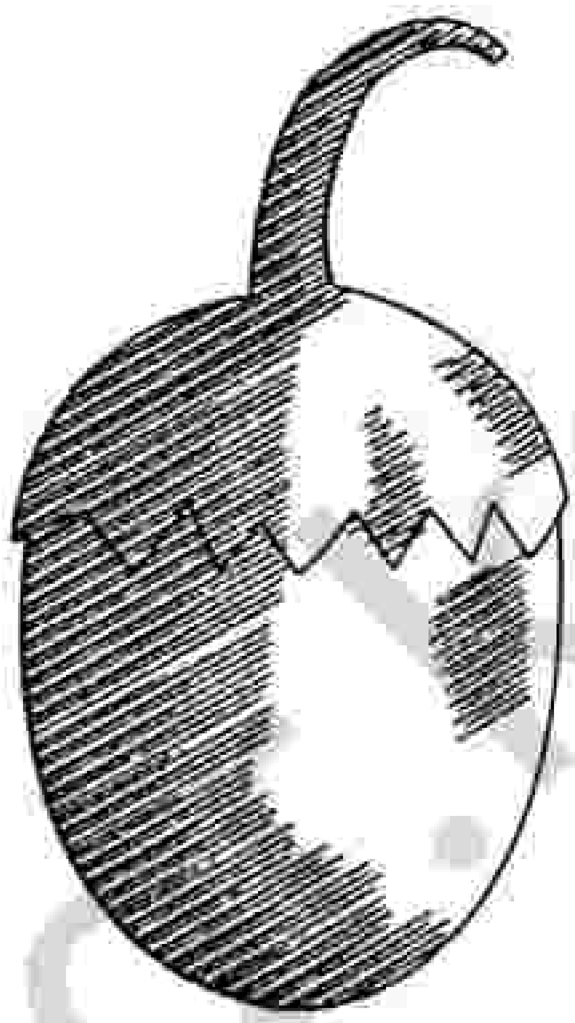
क्षारैरम्लैश्च गन्धाद्यैर्मूत्रैश्च पटुभिस्तथा । रसग्रासस्य जीर्णार्थं तद्विडं परिकीर्तितम् । (R. R. S. 8/86)

**6. Vṛntāka mūṣa:**

वृन्ताकाकारमूषायां नालं द्वादशकाङ्गुलम् । धत्तूरपुष्पवच्चोर्ध्वं सुदृढं श्लिष्टपुष्पवत् ।।
अष्टाङ्गुलञ्च सच्छिद्रं सा स्याद् वृन्ताकमूषिका । अनया खर्परादीनां मृदूनां सत्त्वमाहरेत् ।।

(R. R. S. 10/23-24)

A crucible of 12 aṅgula length and breadth, resembling the shape of a bigger sized brinjol is prepared. The closure (lid) should resemble the shape of an inverted 'dhattūra' flower with a 'nāḍī' (pipe like structure) of 8-aṅgula length above. The base of the lid should be wide and should firmly fit with the opening of the mūṣā. This brinjol shaped crucible is known as 'vṛntāka mūṣa'. It is used for sattvapātana of 'kharpara' and other such drugs.



**7. Malla mūṣā:**

निर्दिष्टा मल्लमूषा या मल्लद्वितयसम्पुटात् ।
पर्पट्यादिरसादीनां स्वेदनाय प्रकीर्तिता ।।

(R. R. S. 10/26)

- Other reference:

सम्पुटाकारतां नीता मल्लद्वितययोजनात् । मल्लमूषा समाख्याता पर्पट्यादिप्रसाधिका ।।

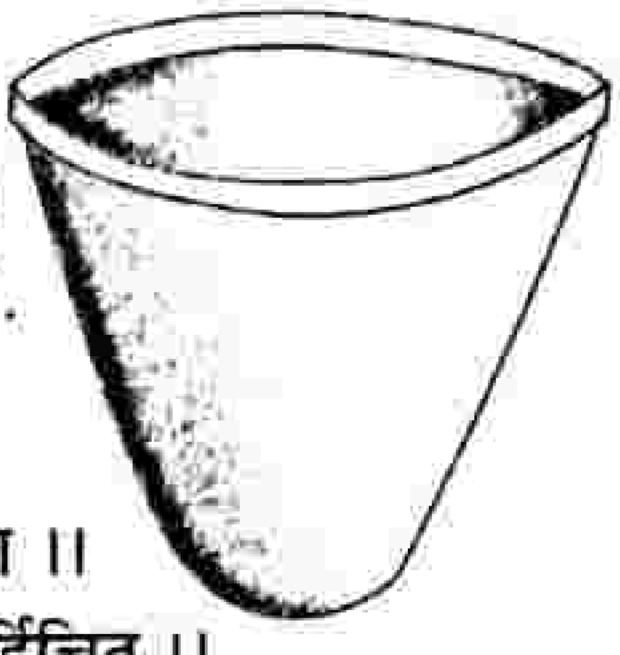
(R. T. 3/16)

Two śarāvas (mud lids used to cover mud pots) sealed face to face will make one 'malla mūṣā'. It may also be called as 'śarāva sampuṭa'. This mūṣā is used for preparing 'parpaṭī' and other 'rasa preparations' and other such preparations.

**8. Pakwa mūṣa:**

कुलालभाण्डरूपा या दृढा च परिपाचिता । पक्वमूषेति सा प्रोक्ता पोट्टल्यादिविपाचने ।।

(R. R. S. 10/27)



The crucible resembling the shape of a mud pot prepared by the potter that is thoroughly baked is known as 'pakwa mūṣā'. It is used for swedana of rasa dravya tied in 'poṭṭalī'.

**9. Vajradrāvaṇikā mūṣā:**

समैर्भूनागगाराद्यैस्तुषाद्यैश्चापि निर्मिता। क्षीरैश्च माहिषैर्मूषा वज्रद्रावणिका मता ।।
वज्रद्रावणिका मूषा वज्रसत्त्वप्रसाधिका । यामद्वयमपि ध्माता नासौ द्रवति कर्हिचित् ।।

(R. T. 3/11-12)

Equal quantities of 1. Dry bhūnāga (earth worm) 2. Gāra (jalapluta mṛttikā or swampy mud) and 3. Ash of husk (dagdha tuṣā); are rigorously triturated with required quantity of 'buffalo's milk' to obtain a sticky and homogenous mixture. From this mixture, the crucibles of desired size and shape are prepared, dried, baked in intense heat and later used as 'vajradrāvaṇikā mūṣā'.

This crucible is considered very strong and durable. It can withstand 6 hours of intense heat without breaking or melting. It is prominently used for sattvapātana of 'vajra' (diamond).

**10. Gāra mūṣā:**

दग्धषड्गुणगारेण मृदा चासितया तु या । विधीयते च किट्टाद्यैर्गारमूषा तु सा मता ।।
यामयुग्ममपि ध्माता नासौ द्रवति निश्चितम् । ढालनादौ विशेषेण रसज्ञैः सा प्रयुज्यते ।।

(R. T. 3/13-14)

1. Black mud- 1 part; 2. Ash of husk (dagdha tuṣa) or gāra (jalapluta mṛttikā or swampy mud)- 6 parts; 3. Maṇḍūra (loha kiṭṭa)- as required; and 4. Jute fibre- as required; all these are taken in a khalva yantra and rigorously triturated to obtain a sticky and homogenous mixture. From this mixture, the crucibles of desired size and shape are prepared, dried, baked in intense heat and later used as 'gāra mūṣā'.

This crucible is considered very strong and durable. It can withstand 6 hours of intense heat without breaking or melting. It is prominently used for melting the metals and pouring the molten metal into any other liquid preparation (ḍhālana) as a part of purification procedure.

### 11. Gola mūṣā:

निर्वक्रगोलकाकार पुटनद्रव्यगर्भिणी । गोलमूषेति सा प्रोक्ता सत्वर द्रवरोधिनी ।।

(R. R. S. 10/28)

The round shaped 'crucible' in which the 'medicinal drug' is placed, closed and sealed completely is called as 'gola mūṣā'. When subjected to heat, this crucible retains the essence of medicinal drugs cooked in it by blocking the drug vapours.

### 12. Vara mūṣā:

वस्त्राङ्गारतुषास्तुल्यास्तच्चतुर्गुणमृत्तिका । गारश्च मृत्तिकातुल्या सर्वैरेतैर्विनिर्मिता ।।
वरमूषेति निर्दिष्टा याममग्निं सहेत् सा ।।

(R. R. S. 10/15)

1. Old cloth (jute)- 1 part; 2. Charcoal powder- 1 part; 3. Ash of husk- 1 part; 4. Any suitable mud- 4 parts; and 5. Swamp of pond- 4 parts; all these are taken in a khalva yantra rigorously triturated to obtain a sticky and homogenous mixture. From this mixture, the crucibles of desired size and shape are prepared, dried, baked in intense heat and later used as 'vara mūṣā'.

This crucible is considered very strong and durable. It can withstand hours of intense heat without breaking or melting. It is used in many suitable pharmaceutical preparations.

### 13. Varṇa mūṣā:

पाषाणरहिता रक्ता रक्तवर्गाम्बुभाविता । मृत्तया साधिता मूषा क्षितिखेचरलेपिता ।।
वर्णमूषेति सा प्रोक्ता वर्णोत्कर्षे नियुज्यते ।।

(R. R. S. 10/16)

The 'red coloured mud' free from physical impurities is taken in required quantity in a khalva yantra. It is added with required quantity of 'rakta varga dravya swarasa' and triturated rigorously to obtain a sticky and homogenous mixture.

From this mixture, the crucibles of desired size and shape are prepared, dried and baked in intense heat. Later the 'mūṣā' is smeared with the paste prepared out of 'sphaṭika' and 'kāsīsa' and dried again to use as 'varṇa mūṣā'.

This crucible is considered very strong and durable. Since it does the 'varṇotkarṣa' (improvement in the colour) of the drugs processed in it, it is called as 'varṇa mūṣā'.

### 14. Rūpya mūṣā:

एवं हि श्वेतवर्गेण रूप्यमूषा प्रकीर्तिता ।।

(R. R. S. 10/17)

The preparation of 'rūpya mūṣā' is same as that of 'varṇa mūṣā', except one change, i.e. instead of 'rakta varga dravya swarasa', 'śweta varga dravya swarasa' is used for trituration. It is also called another type of 'varṇa mūṣā' and it does the 'varṇotkarṣa' (improvement in the colour) of the drugs processed in it.

### 15. Viḍa mūṣā:

तत्तद्विड्मृदोद्भूता तत्तद्विडविलेपिता । देहलोहार्थयोगार्थ विडमूषेत्युदाहृता ॥ (R. R. S. 10/18)

Any suitable mud (anthill mud) free from physical impurities is taken in required quantity in a khalva yantra. It is added with required quantity of water and triturated rigorously to obtain a sticky and homogenous mixture. From this mixture, the crucibles of desired size and shape are prepared, dried and baked in intense heat.

Later the 'mūṣā' is smeared with the paste prepared out of any 'special viḍa' (find the reference above) and dried again to use as 'viḍa mūṣā'. This crucible is used to prepare all the medicines that bring physical strength and endurance in the human body.

### 16. Maṇḍūka mūṣā:

मण्डूकाकारमूषा या निम्नताऽऽयामविस्तरा । षडङ्गुलप्रमाणेन मूषा मण्डूकसंज्ञिका ॥
भूमौ निखन्य तां मूषां दद्यात्पुटमथोपरि ॥ (R. R. S. 10/30)

The 'crucible' which is prepared in the shape of a frog; and which has the length, width and height of 6 aṅgula each is called as 'maṇḍūka mūṣā'. This 'mūṣā' is buried under ground and subjected for 'puṭa' from above.

### 17. Mūsala mūṣā:

मूषा या चिपिटा मूले वर्तुलाऽष्टाङ्गुलोच्छ्रया । मूषा सा मूसलाख्या स्याच्चक्रिबद्धरसे हिता ॥
(R. R. S. 10/31)

The 'crucible', which has cylindrical shape with 8 aṅgula length and flat base, is called as 'mūsala mūṣā'. This 'mūṣā' is used for bandhana of 'cakrabaddha pārada'.

Note: As per 'Rasaprakāśa Sudhākara', the inner circumference of 'mūsala mūṣā' should not be not more than 2 aṅgula. वर्तुलाद्वयङ्गुलाच्च या ।

### Mūṣāpyāyana:

द्रवे द्रवीन्मुखे जाते मूषाया बह्नियोगतः । निष्कासनं क्षणं यत्तु तन्मूषाप्यायनं मतम् ॥ (R. T. 3/21)

- Other reference:

द्रव्ये द्रवीभावमुखे मूषाया ध्मानयोगतः । क्षणमुद्धरणं यत्तन्मूषाऽऽप्यायनमुच्यते ॥
(R. R. S. 10/31)

The act of taking out the medicine filled, red-hot crucible, outside the fire for few second, after having placed it inside the furnace or bhaṭṭī is called as 'mūṣāpyāyana'. This act is done at the time when the drug inside the crucible starts to melt. By doing so, the heat withstanding capacity of the crucible is enhanced.

### Mūṣā- sandhi lepana:

> मूषादीनां तु यत्सन्धौ किट्टाद्यैः स्याद्विलेपनम् । तत्सन्धिलेपनं ख्यातं तच्चोक्तं सन्धिबन्धनम् ।।
>
> (R. T. 3/5)

The process of sealing the crucibles or other containers after covering them with the lids is called as 'sandhi-lepana' or 'sandhi-bandhana'. It is done using a sticky material prepared by perfectly mixing 'loha kiṭṭa' along with 'wet mud' and some other specified materials.

### Mūṣā- sandhi bandhana:

> मूषापिधानयोर्बन्धे बन्धनं सन्धिलेपनम् । अन्ध्रणं रन्ध्रणं चैव संश्लिष्टं सन्धिबन्धनम् ।।
>
> (R. R. S. 10/5)

The process of sealing the crucible and its lid (pidhānaka- find the details below) is called as 'sandhi bandhana'. It is also called as 'sandhi lepana', 'andhraṇa', 'randhraṇa' and 'saṁśliṣṭa'.

### Pidhānaka (Lid):

> द्रव्यपूरितमूषादेः द्रव्यपातनिवृत्तये । आच्छादकं भवेद् यत्तु पिधानं तदिहोच्यते ।। (R. T. 3/4)

To prevent the spillage of the drug material from the crucibles, the perfect sized lids that are used as closures on the top of the crucibles (mūṣā) are called as 'pidhānaka'. These lids are made of the same materials used for preparing a crucible, so that they also can withstand the high degree temperature.

Note: The literal meaning of the term 'pidhāna' or 'pidhānaka' is the covering or shutting. Therefore, any lid used in pharmaceutical procedures may be called with this name.

### Madana mudrā:

> औदुम्बराख्यवटदुग्धपलं पलञ्च, लाक्षा पलमृषिपलं त्वथ चुम्बकस्य ।
> सङ्कुट्यमानमतसीफलतैलमिश्रं, सूतस्य जारणविधौ मदनाख्यमुद्रा ।।
>
> (Ānandakanda)

1. Udumbara kṣīra- 1 pala (50 ml); 2. Vaṭa kṣīra- 1 pala (50 ml); 3. Lākṣā rasa- 1 pala (50 ml); and 4. Cumbaka loha cūrṇa (fine powder of magnetic iron)- 7 pala (350 gms); all these are taken in specified quantities in a khalva yantra

and pounded/triturated thoroughly along with required quantity of 'atasī taila'.

While continuous pounding and trituration, when the mixture attains very smooth sticky paste like consistency, it is used as an adhesive to seal the 'mūṣā' (crucible) and its 'pidhānaka' (lid) during 'pārada jāraṇa'. This adhesive mixture is called as 'madana mudrā'.

**Haṭa mudrā:**

> चुम्बकं  लोहचूर्णं च क्रोडरक्तेन संयुतम् । तत्र सर्वं प्रदातव्यं घनघातेन ताडयेत् ।।
> सन्ध्यारभ्योदयो यावत्सूर्यबिम्बं च दृश्यते । हठमुद्रेति विख्याता सर्वसिद्धैर्नमस्कृता ।।
>
> (Ānandakanda)

The fine powder of 'cumbaka loha cūrṇa' (fine powder of magnetic iron) is taken in required quantity in a khalva yantra and added with same quantity of 'pig's fresh blood' (kroḍa rakta). The mixture is triturated thoroughly from sunset to sunrise (roughly 12 hours).

When the mixture attains very smooth sticky paste like consistency, it is used as an adhesive to seal the 'mūṣā' (crucible) and its 'pidhānaka' (lid) during 'pārada jāraṇa'. This adhesive mixture is called as 'haṭa mudrā'.

Note: Trituration during cool hours of night, facilitates presence of liquid part in the mixture for a longer time and in turn helps in formation of better and stickier adhesive paste.

⁂

## Chapter 7

# KOṢṬHĪ

## (Specially Built Fireplaces)

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**Koṣṭhī/Koṣṭhikā- definition:**

सत्त्वादिपातनाद्यर्था द्रव्यढालनसाधिका । वह्निसन्धानिका या तु कोष्ठिका सा निगद्यते ।।

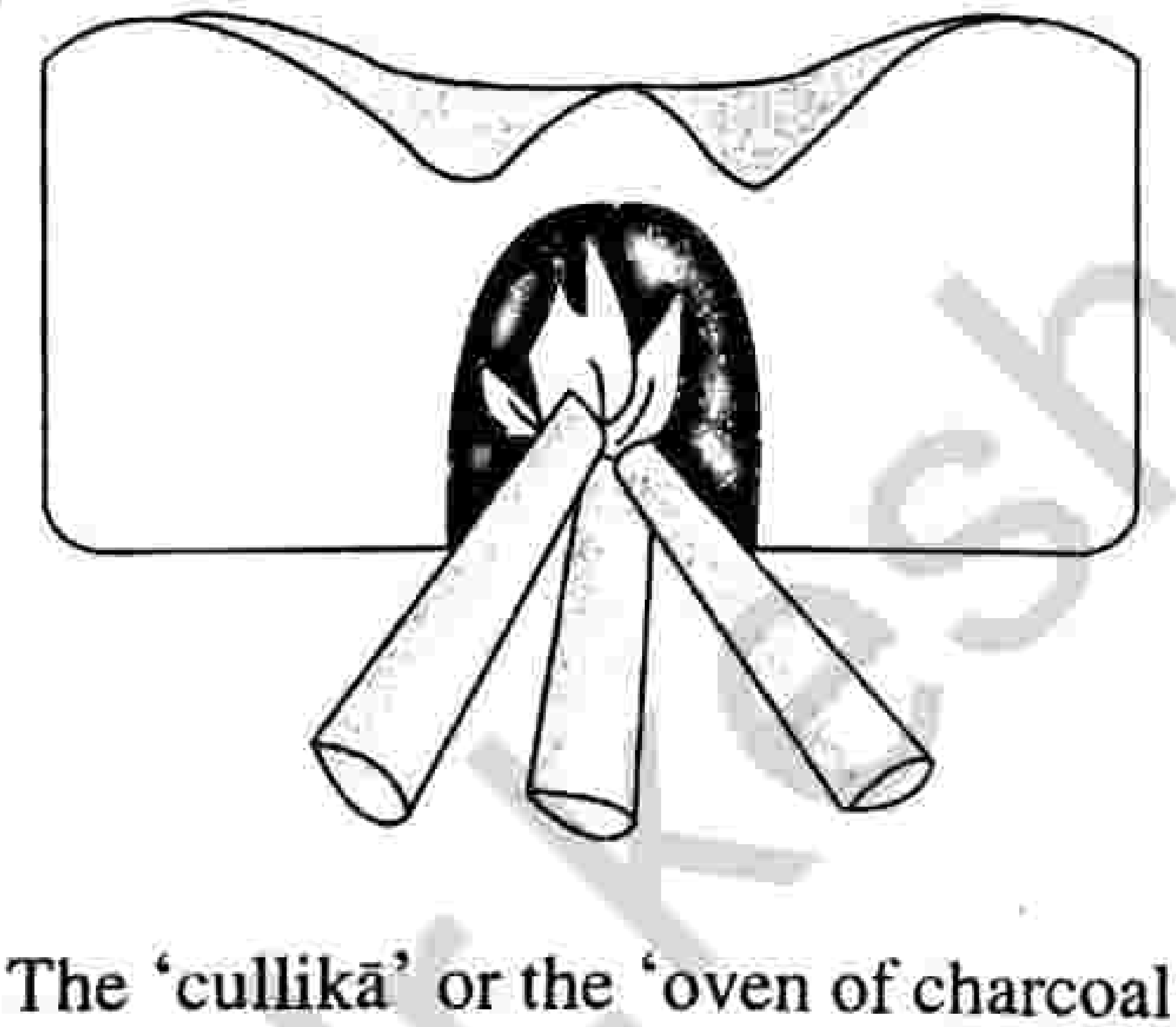
(R. T. 3/24)

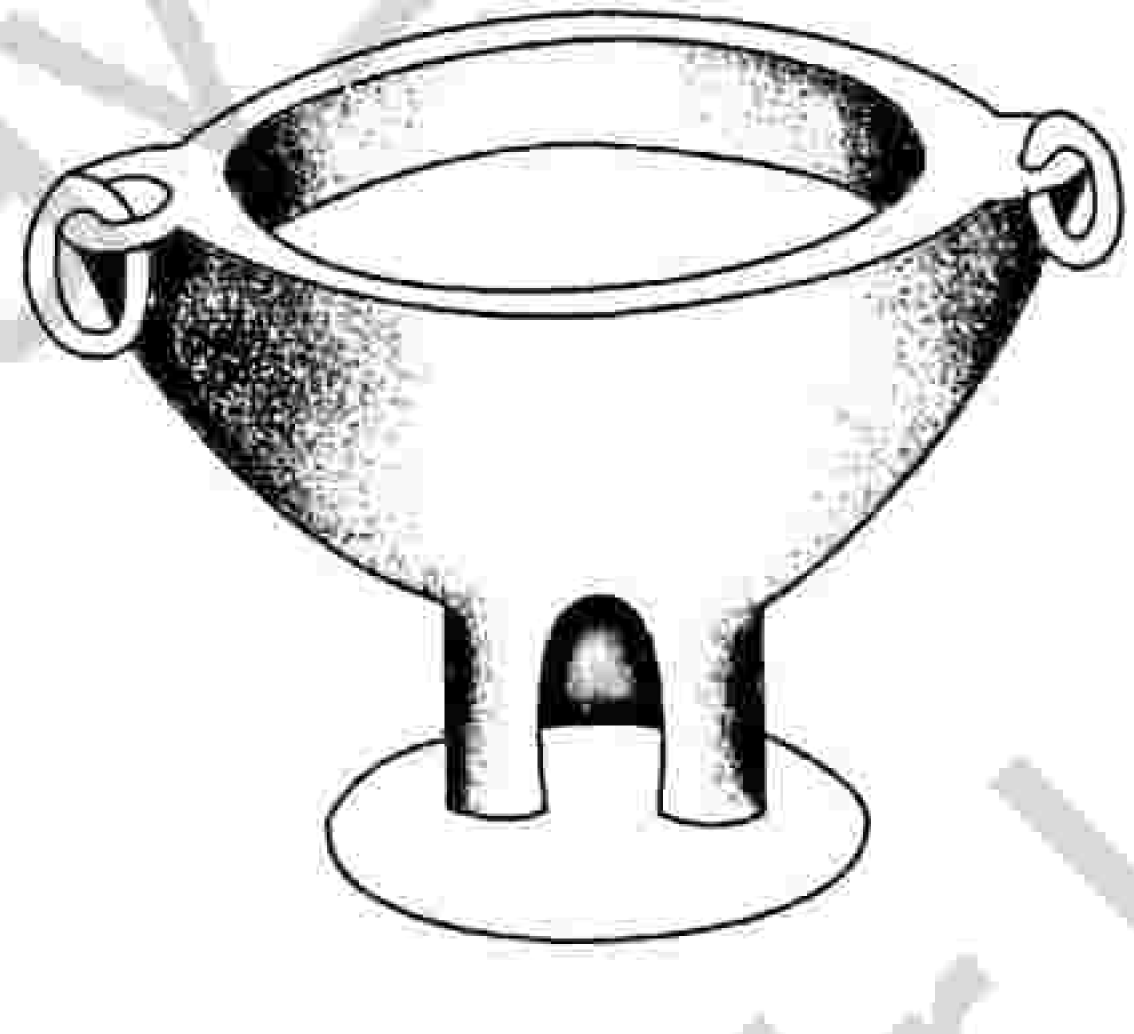
For extraction of dravya sattva and for the purpose of ḍhālana, the special ovens used are called as 'koṣṭhikā'. Since all the four sides will be covered in this 'koṣṭhikā', the intensity of the fire will be more.

**Cullikā/Aṅgāradhānikā:**

अङ्गारधानिका ख्याता हसन्ती च हसन्तिका । अङ्गारशकटी चापि हसनी च निगद्यते ।।
अङ्गारधानिका ह्येषा मृदुद्रव्यप्रसाधिका । वङ्गादीनां ढालनादौ विशेषेण प्रयुज्यते ।।

(R. T. 3/22-23)





The 'cullikā' or the 'oven of charcoal' is called with different names such as; 'aṅgāradhānikā', 'hasanti', 'hasantikā', 'aṅgāraśakaṭī' and 'hasanī'. The soft drugs (mṛdu dravya) are heated and melted over this special oven. It is useful in melting vaṅga (tin), nāga (lead) etc during their śodhana/ḍhālana.

**Sattvapātana koṣṭhī:**

For the purpose of liquefying the metals and minerals or for the extraction of their essence (sattva), different types of 'koṣṭhī' were prepared in olden days and were called 'sattvapātana koṣṭhī' in general.

In classics we find, **'Pātāla-koṣṭhī'**, **'Gāra koṣṭhī'** and **'Aṅgāra-koṣṭhī'** explained in detail. But other than these three, different types of 'koṣṭhī' are also constructed and used. On a broder basis, the 'koṣṭhī' can be categorized into two types as below;

1. Koṣṭhī (simple oven)
2. Bhastrikā koṣṭhī (ovens fitted with blowers or vaṅkanāla)

**Vaṅkanāla:**

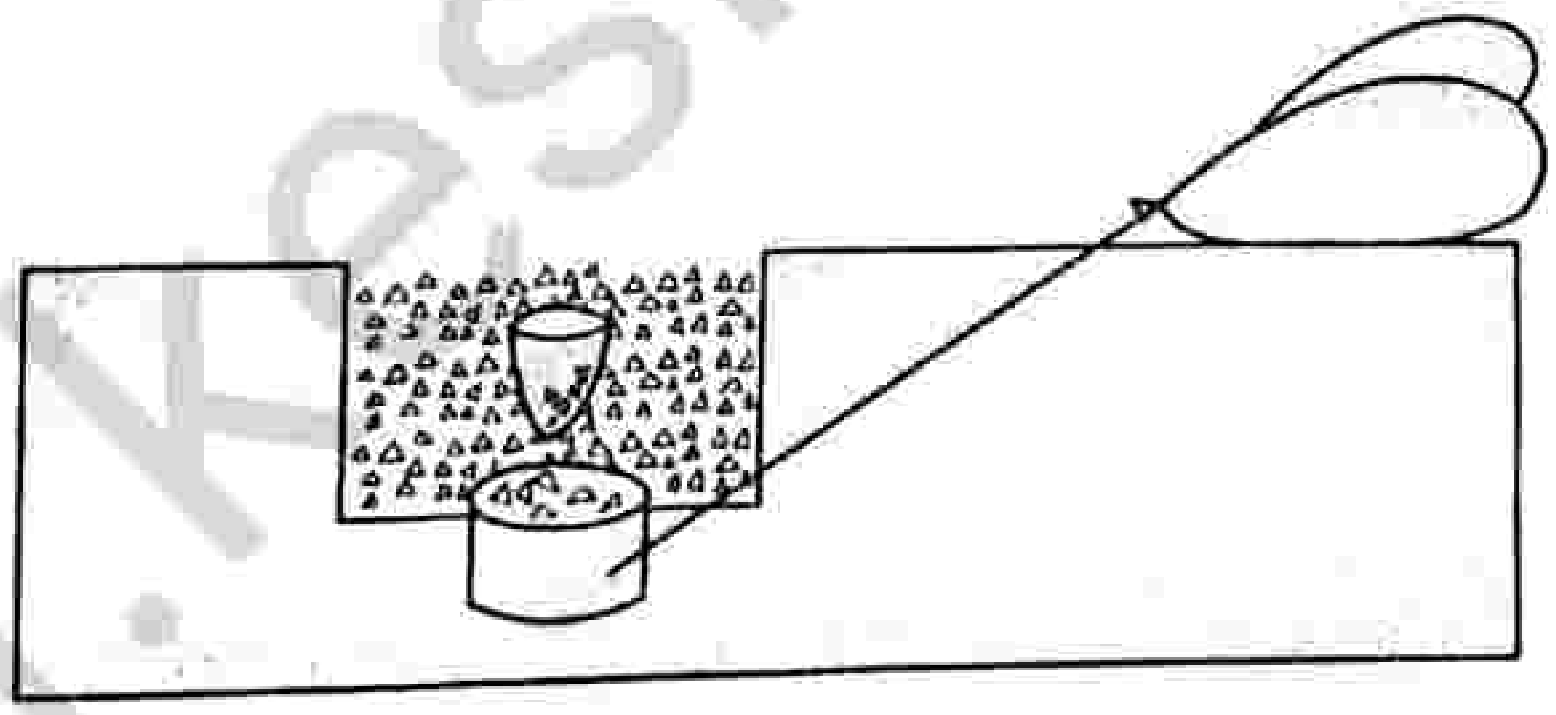
> करप्रमाणं यन्नालं पित्तलादिविनिर्मितम् । वह्नौ फूत्कारदानाय वङ्कनालं तदुच्यते ।।
>
> (R. T. 2/46)

A metallic pipe of roughly one 'hasta' (18 inches) length, made of any suitable metal (brass, iron, copper etc), used for blowing the fire to intensify the heat is known as 'vaṅkanāla' (blower). It is also called as 'vaktranāla' as it is used for blowing through mouth. This 'vaktranāla' is still in use where the cooking is done over firewood.

Note: **Bhastrikā** were traditional manual blowers used in olden days to maintain the high intensity of heat in ovens. Now a days the 'blowers' (either manual or mechanical) have replaced them.

**1. Pātāla-koṣṭhi**:

> वितस्तिविस्तृतं गर्तं भूमौ कुर्याद्विधानतः । तन्मध्ये वर्तुलं छिद्रं निम्नवेशे प्रकल्पयेत् ।।
> गर्तमध्यगते छिद्रे तिर्यङ् नालं निवेशयेत् । नालवक्त्रे च भस्त्राया मुखं सम्यङ् निरोधयेत् ।।
> द्रव्यमूषां कोष्ठिकायां निधाय भस्त्रया धमेत् । पातालकोष्ठिका ह्येषा मृदुद्रव्यप्रसाधिका ।।
>
> (R. T. 3/29-31)



A cylindrical pit measuring 12-aṅgula length (1 vitasti) is made inside the earth. At the base of this pit, another smaller cylindrical pit measuring 4-aṅgula length is made. The base of the smaller pit is fixed with one end of a strong tube that runs out through the earth to the surface by the side of the larger pit. The other end of the tube is connected to a 'vaṅkanāla' (bellows/air-blower) placed by the side of the pit on the ground.

Now, the top of the smaller pit is fixed with a strong mesh (lattice) and the larger pit base is filled with one layer of good quality charcoal. Over that, the drug filled and sealed crucibles are firmly placed. Above them, another layer of charcoal is filled and ignited. The air blow is regulated with the help of bellows (air blower) to the smaller pit. The ash from the larger pit trickles down through the mesh and gets collect at the base of the smaller pit.

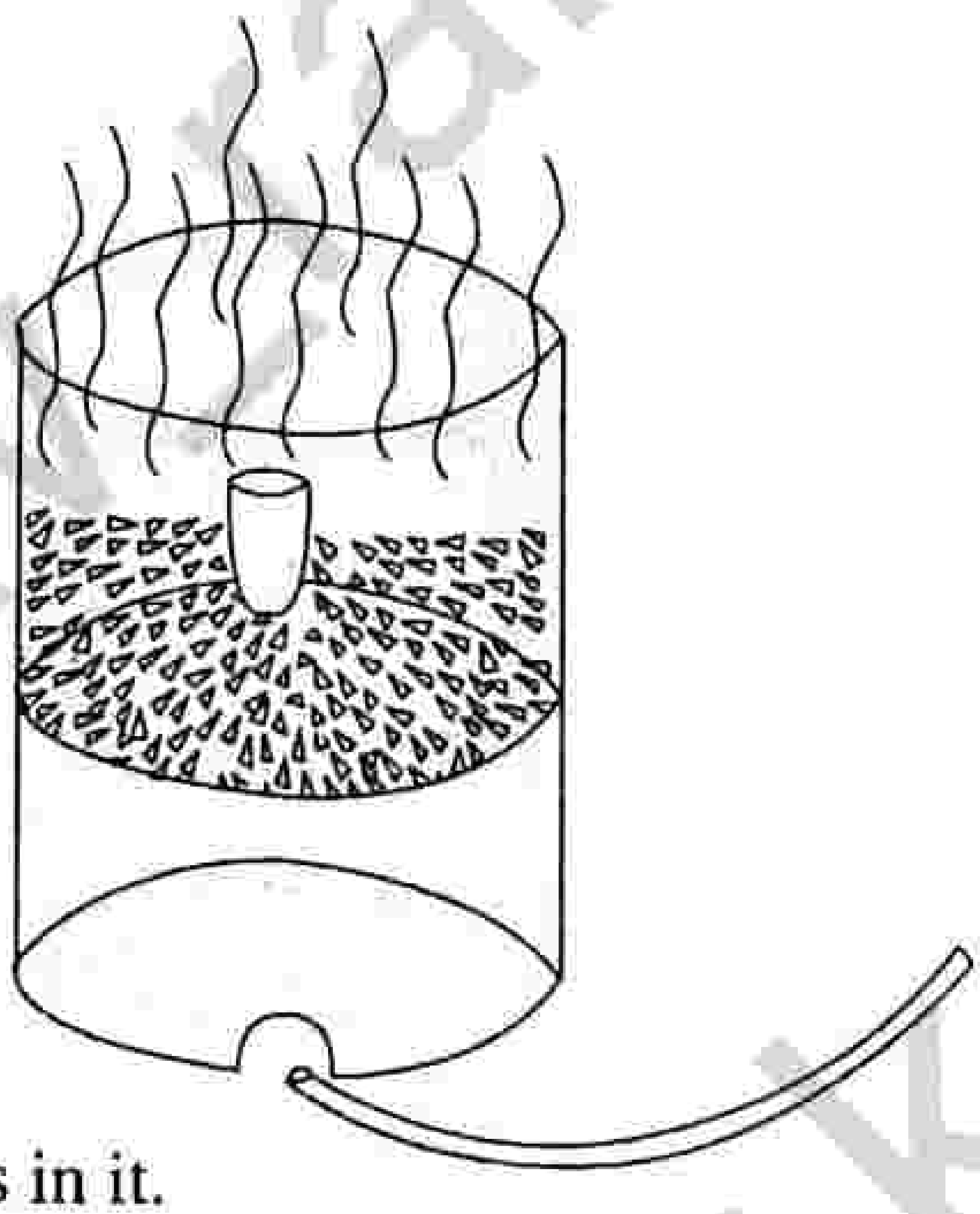
The bhaṭṭī constructed in this manner is called as 'pātāla-koṣṭhikā'. This koṣṭhī is used for 'sattvapātana' of the selected mṛdu dravya (soft drugs).

**2. Gāra koṣṭhī:**

> द्वादशाङ्गुलनिम्ना या प्रादेशप्रमिता तथा । चतुरङ्गुलतश्चोर्ध्वं वलयेन समन्विता ।।
> भूरिच्छिद्रवतीं चक्रीं वलयोपरि निक्षिपेत् । शिखित्रांस्तत्र निक्षिप्य प्रधमेद्वङ्कनालतः ।।
> गारकोष्ठीयमाख्याता मृष्टलोहविनाशिनी ।। (R. R. S. 10/43-44)

A quadrangular oven measuring 12-aṅgula height and 'one pradeśa' (enough) length and width is made either inside the earth as a pit of on a plane ground. At the base of this pit, about 4 aṅgula above from the base a strong iron sieve is strongly fixed in the walls of the koṣṭhī.

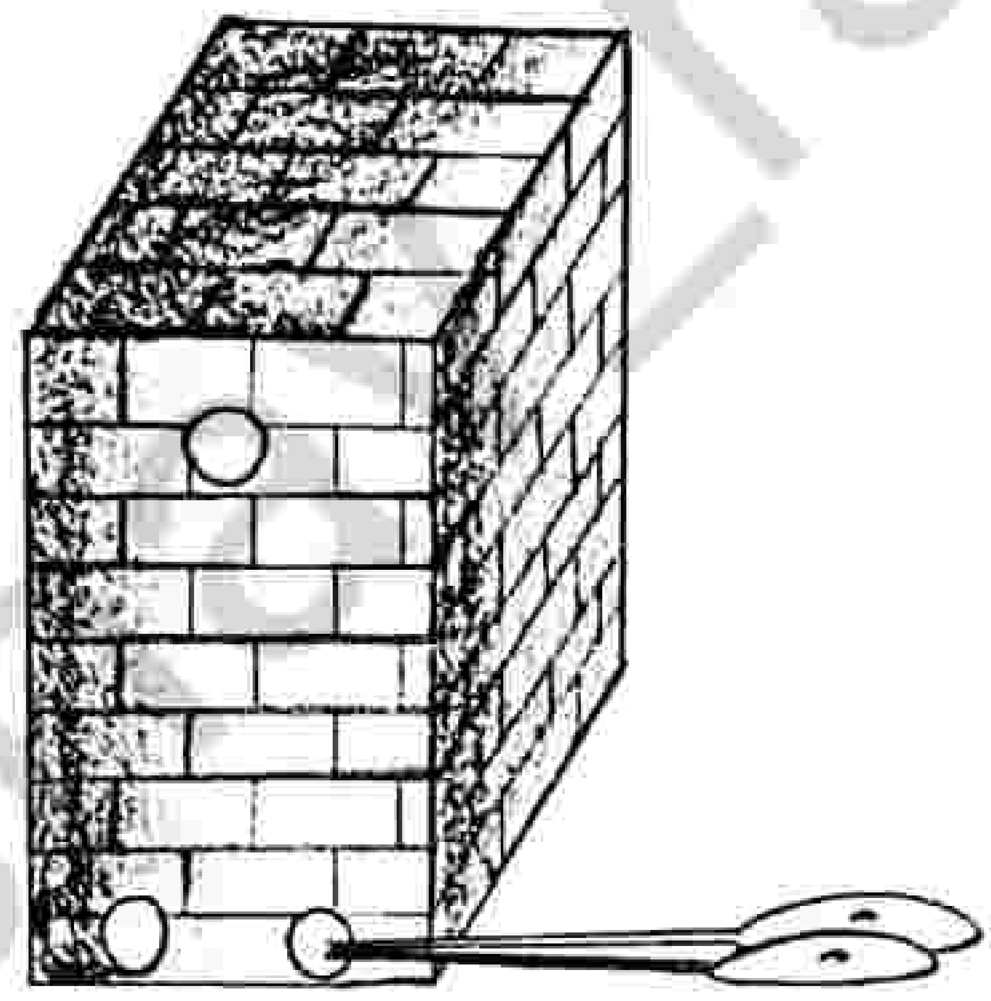
Above this iron sieve, the charcoal are filled, 'sampuṭita auṣadha dravya' is placed and ignited. The heating process is kept intense with the help of blower (vaṅkanāla). This type of special oven are called as 'Gāra koṣṭhī'. This koṣṭhī is used for melting gold, silver, copper etc with the intention of removing the minor alloy metals in it.



**3. Aṅgāra-koṣṭhī:**

> नृपहस्तमितोत्सेधे तदर्धायामविस्तृता । मद्यतश्चतुरस्रा च मृदा च परिलेपिता ।।
> चतुरङ्गुलमानेन रन्ध्रेण परिशोभिता । नालिकां समकोणाञ्च रन्ध्रे तिर्यङ् निवेशयेत् ।।
> नालिकाया मुखे चैव भस्त्रावक्त्रं निवेशयेत् । आपूर्य कोकिलैः कोष्ठीं द्रव्यमूषान्वितां धमेत् ।।
> अङ्गारकोष्ठिका ख्याता द्रव्यढालनसाधिका । सत्त्वानां पातने चेयं विशेषाद्विनियुज्यते ।।
>
> (R. T. 3/25-28)

A fireplace (bhaṭṭī) is built on a plane ground using bricks with an empty space of one nṛpahasta (rājahasta; 22 inches) height and half nṛpahasta (11 inches) length and width inside. See that the empty place inside is not round but quadrangular. Which means that all the four corners inside, should comply with above said height, length and width.



Now, the inner and the outer walls of the bhaṭṭī are evenly covered with fine soft clay, so that the fire/heat from inside do not escape out. Now a round opening of 4-aṅgula diameter is created at the base of any sidewall. In this opening, a metal pipe of required length is fixed. The outer opening of the pipe is connected with a blower.

Now, the bhaṭṭī base is filled with one layer of good quality charcoal. Over that, the drug filled and sealed crucibles are firmly placed. Above them, another layer of charcoal is filled and ignited. The bhaṭṭī constructed in this manner is called as 'aṅgāra-koṣṭhikā'. This koṣṭhī is used for 'ḍhālana' or 'sattvapātana' of the selected drugs.

**Gas stove:**

LPG gas stoves are household cooking means now-a-days. These are used for small scale production of pharmaceutical products. The following are few of the photographs of gas stoves.

**Hot plate:**

Hot plates are electrically run cooking devises. When plugged, the plate above the devise heats up. Any flat based vessel is placed on the plate and cooked. These are also used during pharmaceutical procedures.

**Heating mantle:**

Heating mantles are electrical devises used for heating especially in Research and Development laboratory of pharmaceutical companies. These mantles are required while carrying out procedures of many standardization parameters.

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## Chapter 8

# PUṬA

### (Ancient Pyrometry)

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**Puṭa- definition:**

रसादिद्रव्यपाकानां प्रमाणज्ञापनं पुटम् । नेष्टो न्यूनाधिकः पाकः सुपाकं हितमौषधम् ।।

(R. R. S. 10/47)

- Another reference:

रसोपरसलोहादेः पाकमानप्रमापकम् । उत्पलाद्यग्निसंयोगात् यत्तदत्र पुटं स्मृतम् ।। (R. T. 3/32)

Puṭa is the measured and the methodical way of heat application during the pharmaceutical procedures carried out on 'rasa dravya'. It is the one that indicates the degree of heat, the intensity of heat and the number of times heat is applied to any of the rasa, mahārasa, uparasa, sādhāraṇa rasa, dhātu, ratna, uparatna etc during their processing. In other words, the 'puṭa' indicates the quantitative as well as qualitative measure of heating.

**Puṭa- benefits:**

भवेद्यतः पुटादेव दोषहानिर्गुणोदयः । रसोपरसलोहानां पुटपाकस्ततः स्मृतः ।।
पुटपाकेन लोहादेर्निरुत्थत्वञ्च दीपनम् । भवेद्वारितरत्वञ्च पुटपाकस्ततः स्मृतः ।।
मृतलोहादिकं यस्मादतिशेते मृतं रसम् । पुटपाकविधानेन पुटं तस्मात्प्रशस्यते ।।

(R. T. 3/33-35)

The suitable use of 'puṭa' during the pharmaceutical preparations is beneficial in many ways as given below;

1. Proper application of 'puṭa' helps in purifying the drug (dravya śodhana).
2. It nullifies all the harmful effects (doṣa) of the drug.
3. It encourages the formation of newer compounds that are therapeutically more potent.
4. Dhātu bhasma prepared by application of suitable puṭa, attain the highest therapeutic values.
5. Such 'dhātu bhasma' fulfil all the 'bhasma parīkṣā' (vārītara, rekhāpūrṇa etc) and are readily accepted by the living body tissue.

**Sāmānya puṭa krama:**

मूषागते तु लोहादौ पुटनीये विशेद्यथा । वह्निस्तु स्वानुकूल्येन तथा स्यात्तु पुटक्रमः ।।

(R. T. 3/36)

The application of heat (puṭa) should be such that, the heat uniformly reaches every particle of the drug placed inside 'śarāva sampuṭa' or the 'mūṣā' (crucible).

### Puṭa saṅkhyā:

The decision over the number of 'puṭās' to be applied largely depends on the nature of drug (hardness, density, melting point etc) subjected for puṭa. In general, the ancient authors recommend 10 to 100 puṭās for many rasa dravya for their purification or for incineration.

In case of 'abhraka bhasma', 10 to 500 puṭa are advised to make the bhasma fit for 'vājīkaraṇa karma' and 100 to 1000 puṭa are advised to make the bhasma fit for 'rasāyana karma' (Rasendra Sāra Saṅgraha 1/35).

Drugs with less hardness (e.g.: gourīpāṣāṇa) may require only one puṭa. The calcium compounds like śaṅkha, śukti, kaparda require three puṭās for their incineration. Whereas, the gold, copper and other such metals require up to 40 puṭās for better incineration.

### Types of agni:

> अर्कनिष्कासनार्थाय क्रमाद्देयाः षडग्नयः । धूमाग्निश्चैव मन्दाग्निर्दीपाग्निर्मध्यमस्थता ॥
> खराग्निश्च भटाग्निश्च तेषां वक्ष्यामि लक्षणम् । (Arkaprakāśa 1/80-81)

Arkaprakāśa mentions about the types of 'agni' (for arka niṣkāsana) in his book 'Arka-prakāśa'. He specifies six types of agni as specified below and all these types of 'āgni' are practically relevant at some or the other point of pharmaceutical procedures.

1. Dhūmāgni (heat of smoke)
2. Dīpāgni (heat of a lamp)
3. Mandāgni (mild flames)
4. Madhyamāgni (moderate flames)
5. Kharāgni (high flames) and
6. Bhaṭāgni (very high flames)

### Sūrya puṭa or Roudra puṭa:

> द्रव्याणां भावितानान्तु भावनौषधजै रसैः । शोषणं सूर्यतापे यत्तत्सूर्यपुटमुच्यते ॥ (R. T. 3/37)

After subjecting the drug material to suitable 'bhāvanā' with specified liquid preparations (kwātha, swarasa etc), the drug is impregnated with these liquids and placed daily under hot sun until the liquid dries up. This method is called as 'sūrya puṭa' or 'roudra puṭa'.

Examples:

- Śilājatu śodhana (R. T. 22/69-78)
- Bhānu pāka of 'loha cūrṇa' (R. T. 20/21)

**Candra puṭa:**

After subjecting the drug material to suitable 'bhāvanā' with specified liquid preparations (kwātha, swarasa etc), the drug is impregnated with these liquids and placed daily night under 'moon light' on cloudless days. This method is called as 'candra puṭa' or 'soma puṭa'.

Examples:

- Candrapuṭa of 'Pravāla bhasma' (3rd method in Rasatantrasāra & Siddhaprayoga Saṅgraha; Part- I; Page no 94)

**1. Gorvara puṭa or Gomaya puṭa:**

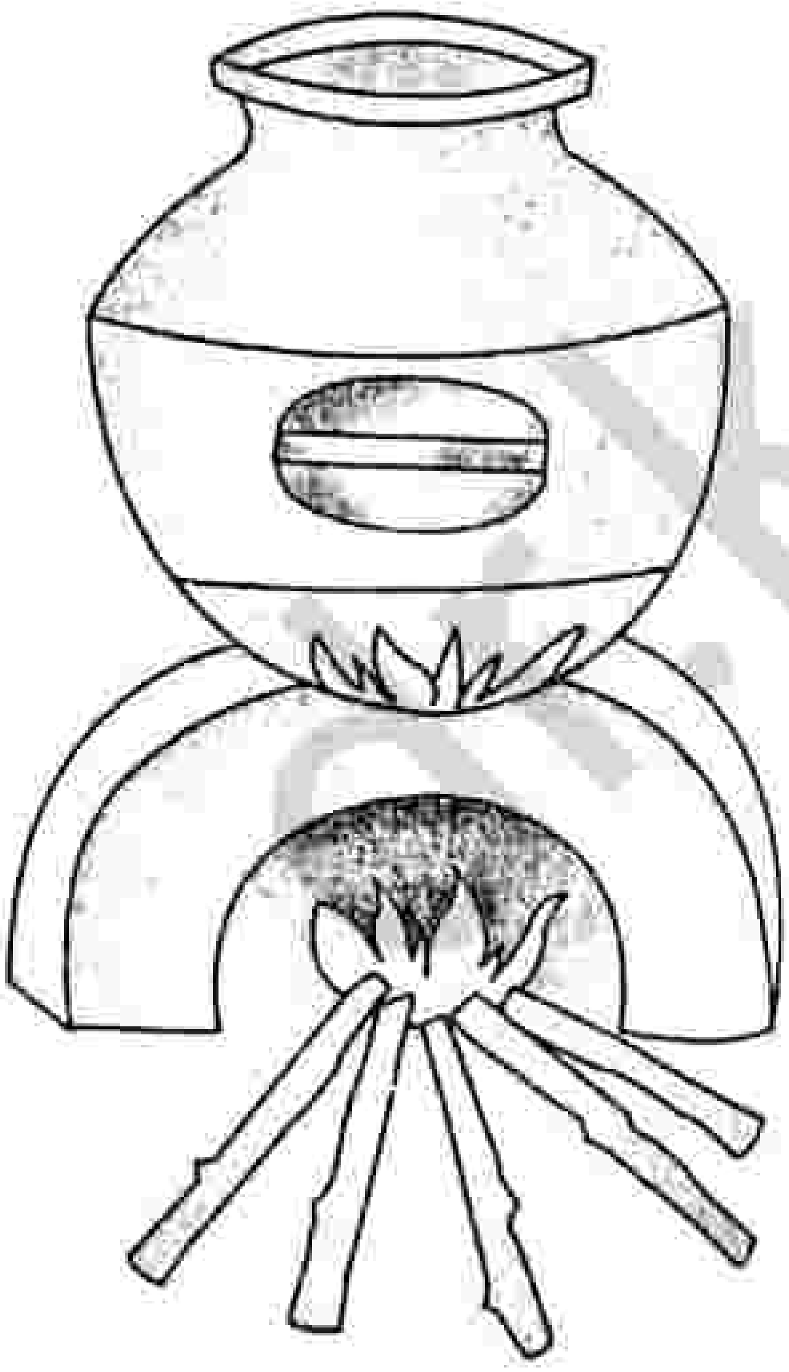
गोर्वरैर्वा तुषैर्वापि खलु कुण्डेऽथवा क्षितौ । पुटं यद्दीयते विज्ञैस्तद् गोर्वरपुटं स्मृतम् ।।

(R. T. 3/44)

- Other reference:

तुषैर्वा गोमयैर्वापि रसभस्म प्रसाधनम् । मानिकाद्वय मानेन गोर्वरं पुटमुच्यते ।। (R. P. Su. 10/47)

Whenever the dry cow dung powder (collected from the place where cattle are tied) or the husk is used as fuel to apply heat, the puṭa will be called as 'gorvara' or 'gomaya' puṭa.



Two māṇika (2 śarāva; 768 gms) of this dry cow dung powder or husk is filled in a bigger sized vessel (Ref: Rasaprakāśa sudhākara 10/48; find below), the enclosed (śarāva samputita) medicine is placed deep inside and ignited. This is called as 'gorvara' or 'gomaya' puṭa. The temperature here will be relatively of low intensity.

When cool on its own (swāṅga śīta) the drug is collected back, triturated in a clean khalva yantra and used for further pharmaceutical procedures or for therapeutic purposes.

Utility: Gorvara puṭa or Gomaya puṭa is used to prepare 'pārada bhasma'.

**2. Lāvaka puṭa:**

गोर्वरैर्वा तुषैर्वापि वितस्त्यूर्ध्वं पुटन्तु यत् । मृदुद्रव्यप्रसिद्ध्यर्थं तल्लावकपुटं मतम् ।।

(R. T. 3/48)

- Other reference:

ऊर्ध्वं षोडशिकामात्रैस्तुषैर्वा गोर्वरैः पुटम् । यत्र तल्लावकाख्यं स्यात् सुमृदुद्रव्यसाधने ॥
(R. R. S. 10/63)

The rough powder of natural cow dung cakes or the husk is heaped up on the ground, around the enclosed (samputita) medicinal drug and ignited. This is called as 'Lāvakapuṭa'. The temperature here will be relatively of low intensity, so it is used only in case of soft drugs.

Note: Ṣoḍaśikā is the synonym for 'karṣa' (12 gms); and Ṣoḍaśī is the synonym for 'pala' (48 gms); here it is better to consider one pala of the drug.

When cool on its own (swāṅga śīta) the drug is collected back, triturated in a clean khalva yantra and used for further pharmaceutical procedures or for therapeutic purposes.

Utility: For incineration of very soft drugs, pārada jāraṇa etc;

### 3. Kukkuṭa puṭa:

वितस्तिद्वयमानेन निम्ने च चतुरस्रके । पुटं यद्दीयते तत्तु मतं कुक्कुटकं बुधैः ॥ (R. T. 3/42)

- Other reference:

पुटं भूमितले तत्तद्वितस्तिद्वितयोच्छ्रयम् । तावच्च तलविस्तीर्णं तत्स्यात्कुक्कुटकं पुटम् ।
(R. R. S. 10/56)

A cubical pit measuring two 'vitasti' (18 inches); (distance between tips of stretched thumb and little finger) in length, breadth and height is prepared. The pit is filled with dry natural cow dung cakes upto the neck. Over that, samputita dravya (drug pallets enclosed in a śarāva sampuṭa or the drug material taken in a crucible) is firmly placed. Now half of the earlier placed cow dung cakes are heaped above the pit and ignited. This is called as 'kukkuṭapuṭa'. The pit roughly accommodates 50 to 60 dry cow dung cakes.

OR

The cowdung cakes (50 to 60) may be heaped up on the ground around the 'samputita dravya' and ignited.

The temperature may peak in between 200⁰C to 250⁰ C. When cool on its own (swāṅga śīta) the drug is collected back, triturated in a clean khalva yantra and used for further pharmaceutical procedures or for therapeutic purposes.

Utility: Kukkuṭa puṭa is used to prepare 'kapardika bhasma', 'śouktika bhasma', 'tārkṣya bhasma' etc.

### 4. Kapota puṭa:

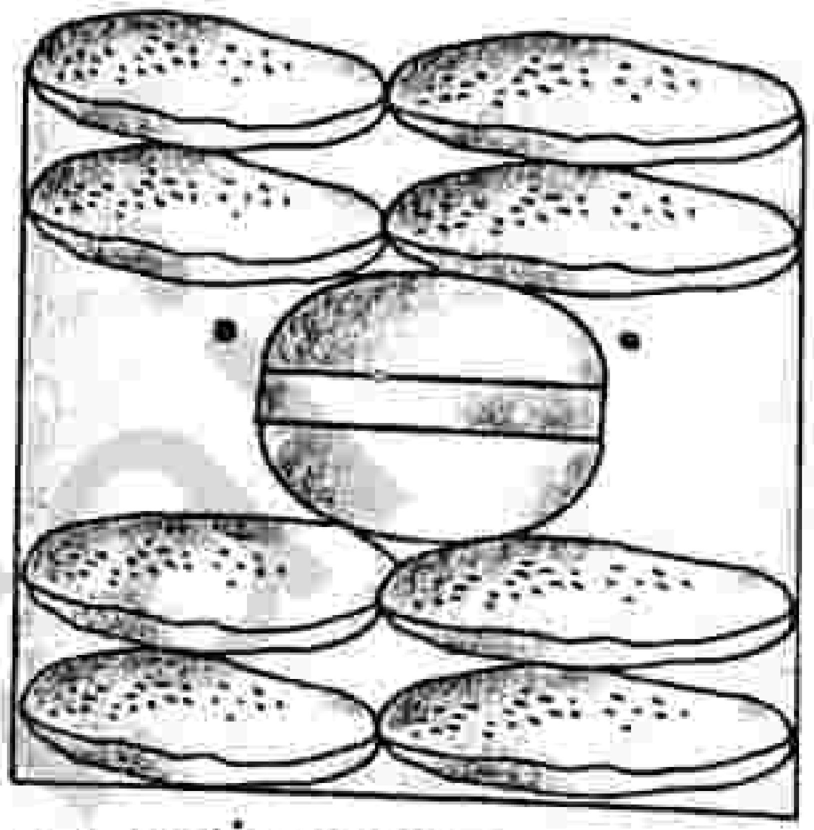
वन्योत्पलैरष्टसंख्यैः क्षिप्तौ यद्दीयते पुटम् । रसादीनान्तु सिद्ध्यर्थं तत्कपोतपुटं स्मृतम् ॥

(R. T. 3/43)

- Other reference:

यत्पुटं दीयते भूमावष्टसङ्ख्यैर्वनोपलैः । बद्ध्वा सूतार्कभस्मार्थं कपोतपुटमुच्यते ॥

(R. R. S. 10/57)



Eight number of natural cow dung cakes are heaped up on the ground, around the enclosed (samputita) medicinal drug; or samputita dravya and 8 dry cowdung cakes are accomedated in a pit as shown in the figure and ignited. This is called as 'kapotapuṭa'. The temperature here will be relatively of low intensity.

When cool on its own (swāṅga śīta) the drug is collected back, triturated in a clean khalva yantra and used for further pharmaceutical procedures or for therapeutic purposes.

Utility: Kapota puṭa is used to prepare 'śilājatu bhasma', 'haratāla bhasma', 'pārada bhasma' etc.

### 5. Varāha puṭa:

कुण्डे त्वरत्निमानेन चतुरस्रे तथोच्छ्रिते । पुटं यद् दीयते तत्तु वाराहपुटमुच्यते ॥ (R. T. 3/41)

- Other reference:

इत्थं च अरत्निके कुण्डे पुटं वाराहमुच्यते ॥

(R. R. S. 10/55)

A cubical pit measuring one 'aratni' (16.5 inches; distance between elbow joint and little finger tip) in length, breadth and height is prepared. The pit is filled with dry natural cow dung cakes upto the neck.

Over that, samputita dravya (drug pallets enclosed in a śarāva sampuṭa or the drug material taken in a crucible) is firmly placed. Over that half od the earlier placed dry cowdung cakes are heaped and ignited. This is called as 'varāhapuṭa'.

Here also the enclosed drug receives the heat from all directions. Temperature in this puṭa will not be as intense as mahā puṭa and gaja puṭa. After all the cow dung cakes are burnt, the temperature gradually comes down.

When cool on its own (swāṅga śīta) the drug is collected back, triturated in a clean khalva yantra and used for further pharmaceutical procedures or for therapeutic purposes.

Utility: Varāha puṭa is used to prepare 'kapardika bhasma', 'śouktika bhasma', 'agnipuṭita pravāla bhasma' etc.

**6. Gajapuṭa:**

> नृपकरचतुरस्रोत्सेधदैर्घ्ये तु कुण्डे छगणगणभृतार्द्धे मूषिकां स्थापयित्वा ।
> पुटनमिह भवेद्यच्छाणपूर्णेऽर्द्धभागे गजपुटमिह तन्त्रे भाषितं तद्रसज्ञैः ।। (R. T. 3/40)

• Other reference:

> राजहस्तप्रमाणेन चतुरस्रञ्च निम्नकम् । पूर्णञ्चोपलसाठीभिः कण्ठावध्यथ विन्यसेत् ।।
> विन्यसेत् कुमुदीं तत्र पुटनद्रव्यपूरिताम् । पूर्णच्छगणतोऽर्धानि गिरिण्डानि विनिक्षिपेत् ।।
> एतद्गजपुटं प्रोक्तं महागुणविधायकम् ।। (R. R. S. 10/53-54)

A cylindrical / cubic pit measuring one 'nṛpahasta' (rājahasta; 22 inches) in breadth and depth is prepared. The pit is filled with dry natural cow dung cakes upto the brim. Over that, samputita dravya (drug pallets enclosed in a śarāva samputa or the drug material taken in a crucible) is firmly placed.

Now half of the earlier filled dry natural cow dung cakes are heaped up above and ignited. The pit accommodates 1000 dry cow dung cakes. This is called as 'gajapuṭa'.

Here also the enclosed drug receives the heat from all directions. Initially after igniting the cakes, the temperature will not be so intense. But gradually when all the cakes catch up with fire, the temperature steadily rises and peaks in between 800° C to 1000° C.

The same temperature remains for a long time. After all the cow dung cakes are burnt, the temperature gradually comes down and the pit takes a long time (overnight) to cool down on its own (swāṅga śīta). Later the drug is collected back, triturated in a clean khalva yantra and used for further pharmaceutical procedures or for therapeutic purposes.

Utility: Gajapuṭa is used to prepare 'vajra bhasma', 'abhraka bhasma', 'śaṅkha bhasma' etc.

Note: When heat of such high intensity is given, one should be certain that the 'śarāva samputa' or the 'mūṣā' containing drug material, withstands the heat. The sealing done to both 'śarāva samputa' or the 'mūṣā' should also be strong enough to survive the heat. It is always wise to construct the base of the pit with a layer of strong bricks and cement, so that the pit remains strong for many uses.

The major differences between the above two reference are;

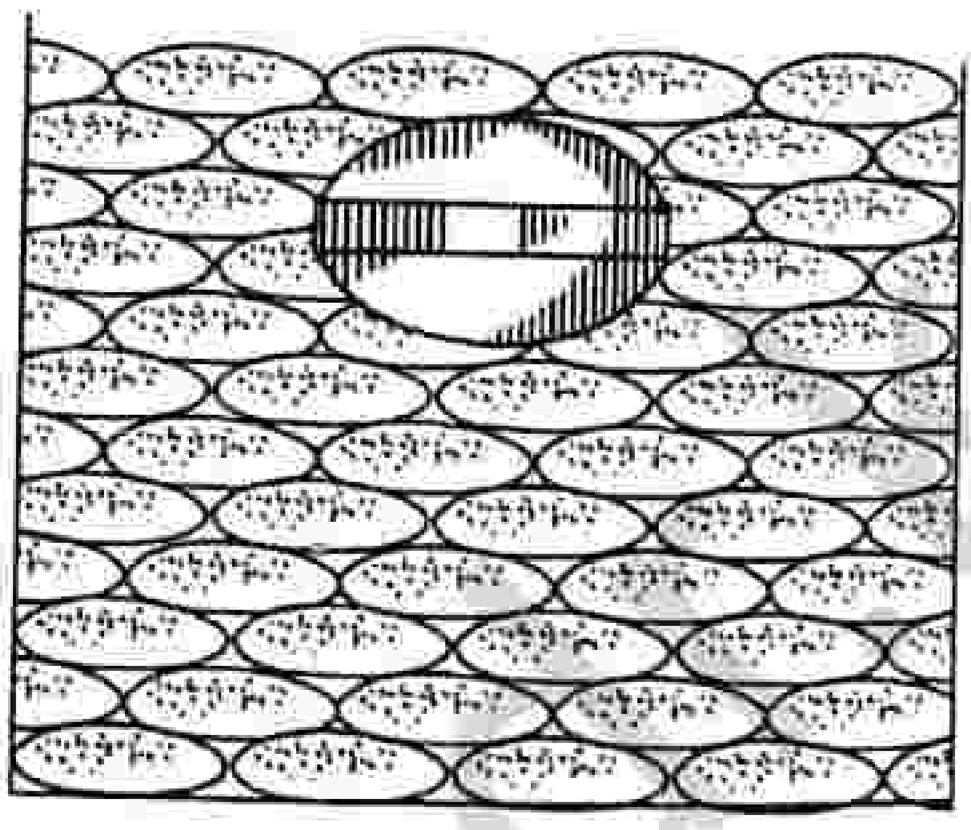
1. In the first reference, the pit prepared was cylindrical in shape but here in second reference the pit will be cubic shaped with one 'nṛpahasta' (rājahasta; 22 inches) in length, breadth and height.
2. In earlier reference, it is asked to fill half of the pit with dry cow dung cakes, place the enclosed medicine and later fill the remaining pit with cakes up to the brim. However, in later reference the pit is filled up to the brim with cakes at base, enclosed medicine is placed and over that half of the numbers of cakes filled at the base are spread over the top of the medicine. However, in both cases the pit may accommodate 1000 dry natural cow dung cakes.

### 7. Mahā-puṭa:

व्यामार्द्धनिम्ने चतुरस्ररूपे हस्तद्वयायाममिते च कुण्डे ।
वन्योत्पलापूरितगर्भभागे मूषां निदध्यात्पुटनीयपूर्णाम् ।।
पुनस्तु विन्यस्य वनोत्पलानि सम्पूरयेत्कुण्डमुखं रसज्ञः ।
सन्दीप्य वह्निं पुटनं ततस्तन्महापुटाख्यं विबुधैः प्रदिष्टम् ।। (R. T. 3/38-39)

- Other reference:

निम्ने विस्तरतः कुण्डे द्विहस्ते चतुरस्रके । वनोत्पलसहस्रेण पूरिते पुटनौषधम् ।।
क्रौञ्च्यां रुद्धं प्रयत्नेन पिष्टिकोपरि निक्षिपेत् । वनोत्पलसहस्रार्धं क्रौञ्चिकोपरि विन्यसेत् ।।
वह्निं प्रज्वालयेत्तत्र महापुटमिदं स्मृतम् ।। (R. R. S. 10/51-52)



A cylindrical / cubic pit measuring 'half vyāma' (36 inches) (one vyāma is the distance between middle fingertips of both stretched hands (4 hasta) i.e. 72 inches) in breadth and depth is prepared. The pit is filled with dry natural cow dung cakes upto the brim.

Over that, samputita dravya (drug pallets enclosed in a śarāva sampuṭa or the drug material taken in a crucible) is firmly placed. Now, half of the earlier filled dry cow dung cakes are heaped up above and ignited. This is called as 'mahā puṭa'.

Here the enclosed drug receives the heat from all directions. Initially after igniting the cakes, the temperature will not be so intense. But gradually when all the cakes catch up with fire, the temperature steadily rises to maximum of 1000° C.

The same temperature remains for a long time. After all the cow dung cakes are burnt, the temperature gradually comes down and the pit takes a long time (overnight) to cool down on its own (swāṅga śīta). Later the drug is collected back, triturated in a clean khalva yantra and used for further pharmaceutical procedures or for therapeutic purposes.

Utility: Mahā puṭa is used to prepare 'abhraka bhasma', 'vaikrānta bhasma' etc.

Note: When heat of such high intensity is given, one should be certain that the 'śarāva sampuṭa' or the 'mūṣā' containing drug material, withstands the heat. The sealing done to both 'śarāva sampuṭa' and the 'mūṣā'should also be strong enough to survive the heat.

It is always wise to construct the base of the pit with a layer of strong bricks and cement, so that the pit remains strong for long and for many uses.

The major difference between the two references are;

(1) In the first reference, the pit prepared was cylindrical in shape but in second reference the pit will be cubic shaped with 2 hasta (half vyāma; 36 inches) in length, breadth and height.

(2) In earlier reference, there was no mention about number of 'vanopala' (natural cow dung cakes) but in second reference 1500 cow dung cakes (1000 at the base and 500 above the enclosed medicine) are to be used.

### 8. Kumbha puṭa/Bhāṇḍa puṭa/Mṛdbhāṇḍa puṭa:

मूषागर्भे तुषापूर्णे स्थूले भाण्डेऽग्नियोजनात् । दीयते यत्पुटं विज्ञैस्तद् भाण्डपुटमुच्यते ॥
(R. T. 3/45)

• Other reference:

स्थूलभाण्डे तुषापूर्णे मध्ये मूषासमन्विते । वह्निना विहिते पाके तद्भाण्डपुटमुच्यते ॥
(R. R. S. 10/60)

If the husk is filled in a selected bigger mud pot and used for application of heat, the puṭa will be called as 'bhāṇḍa' or 'mṛdbhāṇḍa' or 'kumbha' puṭa. Here half of the pot is filled with husk, enclosed (sampuṭita) medicinal drug is placed over it and the remaining vacant place of the pot is also filled with husk and later ignited by keeping the mouth of the pot open. The temperature here will be relatively of low intensity.

When all the husk burns and the pot is cool on its own (swāṅga śīta) the drug is collected back, triturated in a clean khalva yantra and used for further pharmaceutical procedures or for therapeutic purposes.

Utility: Bhāṇḍapuṭa is used to prepare 'haratāla bhasma', 'somala or gourīpāṣāṇa bhasma' etc.

### 9. Vālukā puṭa:

प्रतप्तवालुकागर्भे न्यस्य मूषादिकं दृढम् । यद् दीयते पुटं तत्तु वालुकापुटमुच्यते ॥ (R. T. 3/46)

- Other reference:

अधस्तादुपरिष्टाच्च क्रौञ्चिकाच्छाद्यते खलु । बालुकाभिः प्रतप्ताभिर्यत्र तद्वालुका पुटम् ॥
(R. R. S. 10/61)

If the clean dry sand (vāukā) is filled in a selected bigger mud pot and used for application of heat, the puṭa will be called as 'vālukā' puṭa. Here half of the pot is filled with sand, enclosed (samputita) medicinal drug is placed over it and the remaining vacant place of the pot is also filled with dry sand.

This can be done in two ways; 1) Fill the hot sand inṭo the pot with samputita auṣdha dravya in the middle; OR 2) Fill the natural sand, close the pot, place it over fire and heat until sand turns hot.

The temperature here will be relatively of low intensity and remains for long. When cool on its own (swāṅga śīta) the drug is collected back, triturated in a clean khalva yantra and used for further pharmaceutical procedures or for therapeutic purposes.

Utility: Vālukāpuṭa is used to prepare 'haratāla bhasma', 'somala or gourīpāṣāṇa bhasma' etc.

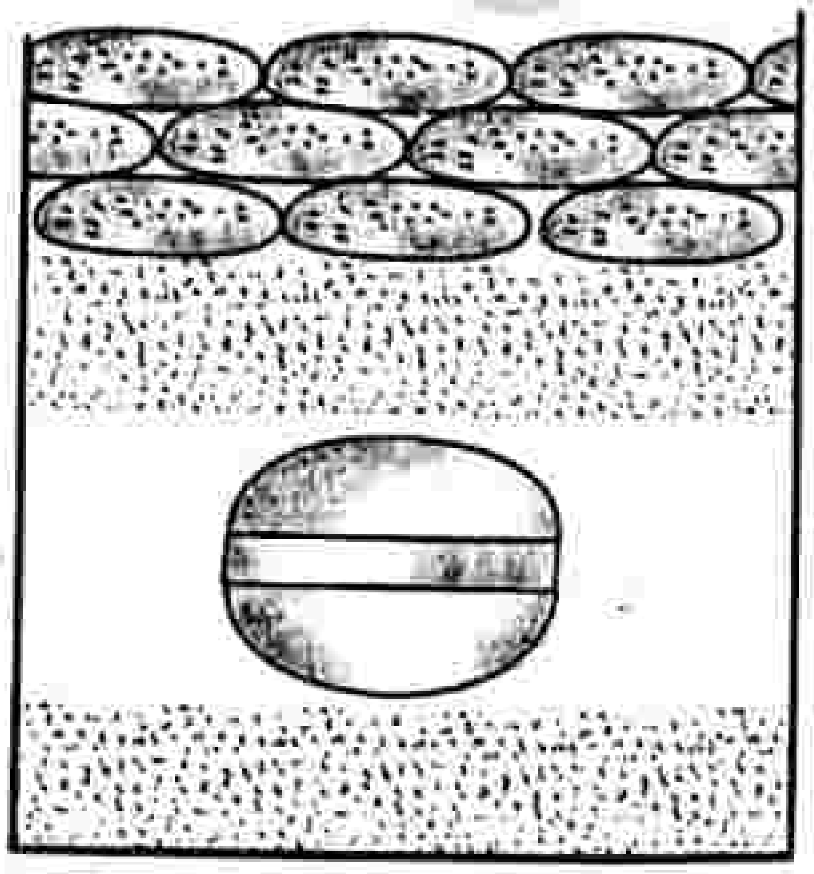
### 10. Bhūdhara puṭa:

भूमिगर्भे कुमुदिकां विन्यस्य द्वयङ्गुलोपरि । यद् दीयते पुटं तत्तु पुटं भूधरसंज्ञकम् ॥ (R. T. 3/47)

- Other reference:

वह्निमित्रां क्षिप्तौ सम्यक् निखन्याद्वयङ्गुलादधः । उपरिष्टात्पुटं यत्र पुटं तद्भूधराह्वयम् ॥
(R. R. S. 10/62)

A small pit is made in ground and enclosed (samputita) medicinal drug is placed inside with 2 inches of sand on all the sides. Now heat is applied from above by heaping the dry cow dung cakes. This type of puṭa application is called as 'bhūdhara puṭa'.



Here numbers of cow dung cakes are not specified, so, it has to be decided depending on the hardness of the medicinal drug. When cool on its own (swāṅga śīta) the drug is collected back, triturated in a clean khalva yantra and used for further pharmaceutical procedures or for therapeutic purposes.

Utility: Bhūdharapuṭa is used to prepare 'pārada bhasma', 'somala or gourīpāṣāṇa bhasma' etc.

### Laghu puṭa:

There is no separate explanation for the term 'laghu puṭa' in classics. In comparison with the 'puṭa' with high intensity of fire (gajapuṭa and mahā puṭa), the puṭa with low fire intensity (example: lāvaka puṭa, kapota puṭa, kukkuṭa puṭa, varāha puṭa, kumbha puṭa or bhāṇḍa puṭa etc) are called as 'laghu puṭa'.

### Anukta puṭa (In case of unspecified puṭa):

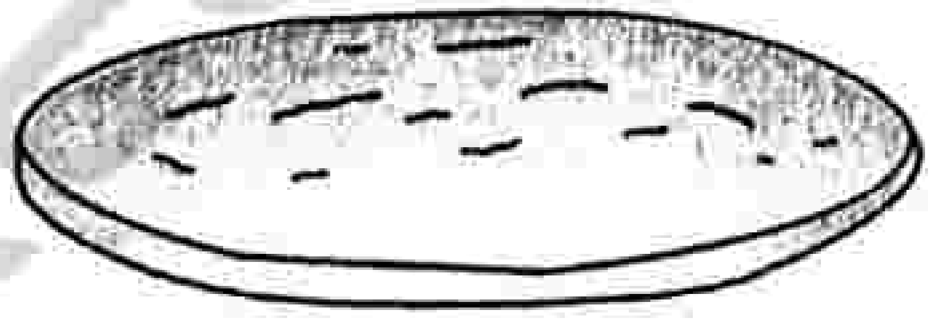
> पुटनाम्नामनिर्देशे वीक्ष्य द्रव्यबलाबलम् । पुटेष्वन्यतमं दद्यात् यत्स्याद्युक्ततमं भृशम् ॥
>
> (R. T. 3/49)

Whenever, the 'puṭa' is not specified for incineration of a medicinal drugs, then depending on the hardness of the drugs, the suitable 'puṭa' has to be selected by the physician himself by his own intelligence (yukti).

### Upala (Natural dry cow dung cakes)- synonyms:

> उपलं चोत्पलं ख्यातं गिरिण्डं पिष्टकं तथा । छाणञ्च छगणञ्चैव करीषञ्च निगद्यते ॥
>
> (R. T. 3/50)

Upala (dry natural cow dung cake) is also called as 'utpala', 'giriṇḍa', 'piṣṭaka', 'chāṇa', 'chagaṇa' and 'karīṣa'. All these words are used in classics to indicate dry cow dung cakes.



### Electric muffle furnace:

An electric **muffle furnace** is a front-loading (horizontal) or top loading (vertical) box-type oven or kiln for high-temperature applications. These are used for all the pharmaceutical procedures in the field of 'Rasaśāstra' where application of high temperature is required.

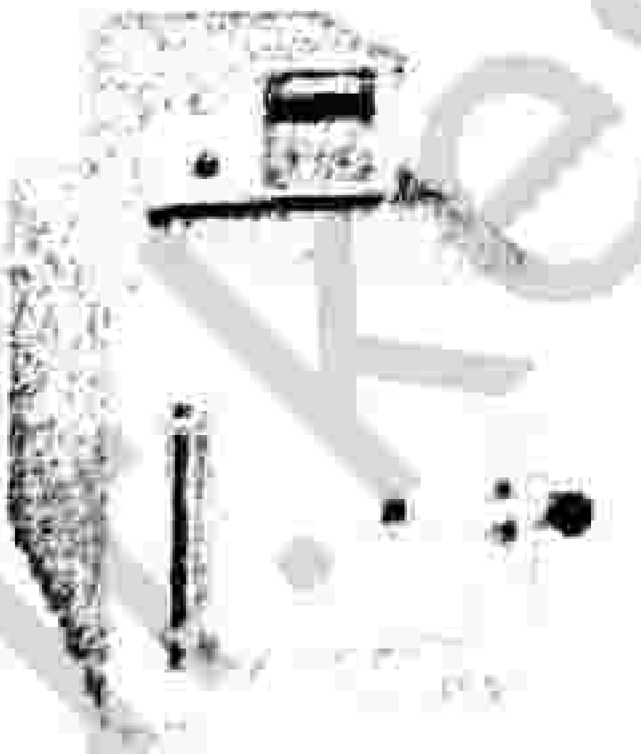
Some of the applications include, 'extraction of sattva' from different metals and minerals, preparation of 'kūpīpakwa rasāyana', 'jāraṇa' (fusion of one metal into another at high temperature) etc.

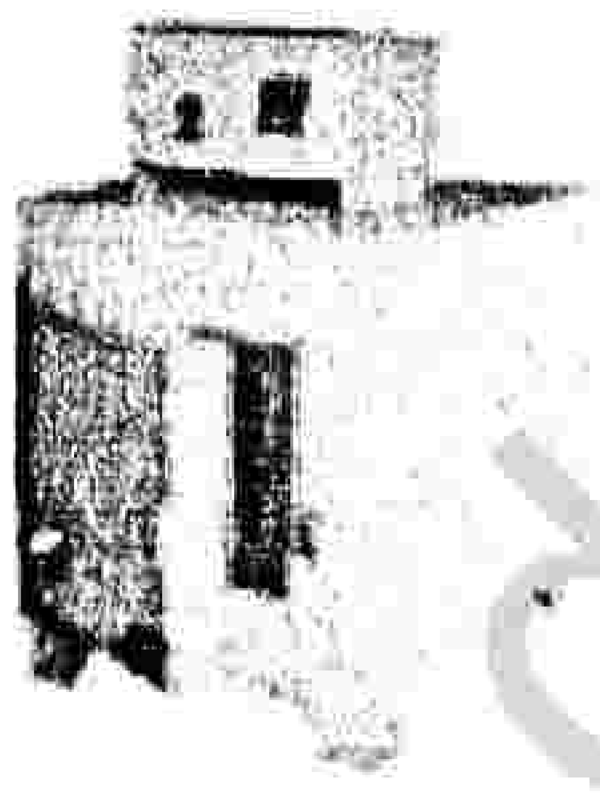
The other general applications include melting of the metals, fusing glass, creating enamel coatings, ceramics, soldering and brazing articles. They are also used in many research facilities, for example by chemists in order to determine the non-combustibility and non-volatility of drug ash sample (ash value).

The furnace can produce working temperatures up to 1800° C, which facilitate more sophisticated metallurgical applications. The advantage of the muffle furnace is a clean, energy-efficient and well-controllable heating process compared to most other means of heating. They are free from dust and pollutants. Since the temperature is well under control, the loss of valuable alloying elements can be effectively prevented.

Most modern 'foundries' (a place where the metals or the glasses are melted and formed into a different shape) use this type of electric furnace. The electric furnace capacities range from less than one kilogram to one hundred tonnes capacity and are used to melt iron and steel, copper, aluminium and precious metals.

Power supplies range from 10 KW to 15 MW, with melt sizes of 20 kg to 30 tonnes of metal respectively. An operating electric furnace usually emits a hum or whine (due to fluctuating magnetic forces and magnetostriction), the pitch of which can be used by operators to identify whether the furnace is operating correctly or at what power level.





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Chapter 9

# PĀRADA

(Mercury)

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**Introduction:**

Sanskrit name : Pārada
English name : Quick silver
Scientific name : Hydrargyrum
Symbol : Hg
Atomic weight : 200.6
Specific gravity : 13.6
Boiling point : 357⁰C
Solidifies at : 39⁰ C

Pārada (mercury) is a silver colored liquid metal which is scientifically identified as 'Hydrargyrum' or 'Quick silver'. Its symbol is Hg, Atomic weight 200.6; Specific gravity 13.6 and Boiling point 357⁰C.

It solidifies at -39⁰ C. It doesn't undergo oxidation at ordinary temperature but tarnishes in air containing traces of hydrogen sulphide. It is not acted upon by diluted or concentrated hydrochloric acid (Hcl).

It dissolves in concentrated sulphuric acid with evolution of sulphur dioxide and formation of mercuric sulphate. It also dissolves in diluted cold nitric acid to form mercurous nitrate but with hot concentrated nitric acid it produces mercuric nitrate.

Mercury is found either naturally or in the form of ores. 1. Mukta/sahaja pārada (Native mercury), 2. Hiṅgula (Cinnabar; HgS), 3. Darada hiṅgula (Hepatic cinnabar) 4. Carmāra hiṅgula (Meta cinnabar), 5. Pravālābha hiṅgula (Coral ore), 6. Daityendra hiṅgula (Estahlerz steel ore), 7. Girisindūra (Brick ore; Ziegelerz) etc;

Amalgams: Mercury dissolves to form amalgams with gold, zinc and many other metals. The metals that do not form amalgams with mercury include tantalum, tungsten and platinum. Sodium amalgam is a common reducing agent in organic synthesis and is also used in high-pressure sodium lamps.

Mercury readily combines with aluminium to form a mercury-aluminium amalgam when the two pure metals come into contact. Since the amalgam destroys the aluminium oxide layer which protects metallic aluminium from oxidizing in-depth (as in iron rusting), even small amounts of mercury can seriously corrode aluminium. For this reason, mercury is not allowed aboard an aircraft under most circumstances because of the risk of it forming an amalgam with exposed aluminium parts in the aircraft.

**Pārada- types/synonyms:**

रसो रसेन्द्रः सूतश्च पारदो मिश्रकस्तथा । इति पञ्चविधो जातः क्षेत्रभेदेन शम्भुजः ।।

(R. R. S. 1/67)

Depending on the different places of availability, 'pārada' is of five types; 1. Rasa 2. Rasendra 3. Sūta 4. Pārada and 5. Miśraka. These five words along with all the other names of 'Lord Śiva' are considered as synonyms of mercury.

**1. Rasa- definition:**

रसनात सर्वधातूनां रस इत्यभिधीयते । जरारुङ्मृत्युनाशाय रस्यते वा रसो मतः ।। (R. R. S. 1/76)

Since the mercury does, the 'rasana' or 'āswādana' (engulf) of 'abhrakādi rasa dravya' and 'swarṇādi dhātu' it is called as 'RASA'. Since its judicious therapeutic use slows down aging process (jarā), heals many diseases (ruja) and delays death (mṛtyu) it is called as 'RASA'.

**2. Rasendra- definition:**

रसोपरसराजत्वाद्रसेन्द्र इति कीर्तितः ।

(R. R. S. 1/77)

Since mercury is considered the supreme dravya out of all rasoparasa, dhātu etc, it is identified with the term 'RASENDRA'.

**3. Sūta- definition:**

देहलोहमयीं सिद्धिं सूतो सूतस्ततः स्मृतः ।।

(R. R. S. 1/77)

Since it reinstates health and helps in pharmaceutical procedures of swarṇa and other dhātu dravya, it is called as 'SŪTA'.

**4. Pārada- definition:**

रोगपङ्काब्धिमग्नानां पारदानाच्च पारदः ।

(R. R. S. 1/78)

Since it saves the humankind from the swamp of diseases, it is called 'PĀRADA'.

**5. Miśraka- definition:**

सर्वधातुगतं तेजोमिश्रितं यत्र तिष्ठति । तस्मात् स मिश्रकः प्रोक्तो नानारूपफलप्रदः ।।

(R. R. S. 1/78)

Since all the dhātu dravya (metals and minerals) are readily digested by 'pārada', it is called as 'MIŚRAKA' and it is the one, which gives many therapeutic benefits.

Note: Since the mercury is elusive by nature, it is branded by the name 'CAPALA'. Since it is the best medicine out of all other rasouṣadhis, it is identified as 'RASARĀJA'. Since it appears like 'molten silver', it is called as 'GALADA-ROUPYANIBHAM'.

**Pārada- occurrence:**

Mercury occurs ~~in~~ deposits throughout the world mostly as cinnabar (mercuric sulfide). Native mercury is an extremely rare element in the Earth's crust, having an average crustal abundance by mass of only 0.08 parts per million (ppm).

However, because it does not blend geochemically with those elements that constitute the majority of the crustal mass, mercury ores can be extraordinarily concentrated considering the element's abundance in ordinary rock. The richest mercury ores contain up to 2.5% mercury by mass and even the leanest concentrated deposits are at least 0.1% mercury (12,000 times average crustal abundance).

It is found either as a 'native metal' (rare) or in 'cinnabar', 'corderoite', 'livingstonite' and other minerals with 'cinnabar' (HgS) being the most common ore. Mercury ores usually occur in very young organic belts where rock of high density are forced to the crust of the earth, often in hot springs or other volcanic regions.

The mines of mercury now are present in parts of South Africa, South America, Australia, Europe, Italy, Spain, China, North America, Hungary, Germany, and New Zealand. These countries do export the 'mercury' to the other parts of the world.

## PĀRADA- NATURAL AND ARTIFICIAL SOURCES

### Pārada- ores:

The 'pārada' comes in two forms as said below;

I. Mukta swarūpa (Native or free mercury)
II. Yougika swarūpa (In the form of ores)

The prominent 'ores' of 'pārada' from which the 'mercury' can be extracted are as given below:

1. Cinnabar (HgS; Hiṅgula)
2. Meta cinnabar (HgS; Carmāra hiṅgula)
3. Hepatic cinnabar (HgS; Darada hiṅgula)
4. Coral ore (Pravālābha hiṅgula)
5. Red oxide of mercury (Brick ore; Girisindūra)
6. Calomel ($Hg_2 Cl_2$)
7. Montrodite (HgO)
8. Living stonite ($2Sb_2S_3HgS$)
9. Steel ore of mercury
10. Liver ore of mercury

Note: Cinnabar is the most prominent ore of mercury since ages. It has been mined since the 'Neolithic age'. During the 'Roman empire', it was mined both as a pigment and for its mercury content; and it has been the main source of mercury throughout the centuries.

To produce liquid (quicksilver) mercury, crushed cinnabar ore is roasted in rotary furnaces. Pure mercury separates from sulphur in this process and easily evaporates. A condensing column is used to collect the liquid metal, which is most often shipped in iron flasks.

**Hiṅgulottha pārada:**

दरदः पातनायन्त्रे पातितं च जलाश्रये । तत्सत्वं सूतसंकाशं जायते नात्र संशयः ॥(R. R. S. 3/144)

Required quantity of aśuddha hiṅgula (cinnabar) is taken in a clean khalva yantra powdered and subjected for trituration with required quantity of 'nimbū swarasa' or any other amla dravya swarasa for a day (8 hours).

Later the paste of hiṅgula is applied at the base of the upper pot of 'adhaḥ pātana yantra' and moderate heat of 3 prahara (9 hours) is applied by heaping up the dry cow dung cakes over the upper part.

By doing so, the 'pārada' from the base of the upper pot, gradually trickles down and gets collected at the base of the lower pot (in water). Later, the yantra is allowed to cool down overnight on its own.

Next morning, pots are separated and 'hiṅgulottha pārada' at the base of the lower pot in the water is cautiously collected. This mercury will be free from all the 'saptakañcuka' doṣas and does not require any of the 'śodhana' or 'saṁskāra'.

### Hiṅgulākṛṣṭa rasa (Hiṅgulottha pārada):

ऊर्ध्वपातनयन्त्रेण हिङ्गुलादुत्थितो रसः । हिङ्गुलोत्थः स्मृतिश्चैव हिङ्गुलाकृष्ट उच्यते ।।
(R. T. 2/31)

• Another reference:

विद्याधराख्ययन्त्रस्थादार्द्रकद्रावमर्दितात् । समाकृष्टो रसो योऽस्यौ हिङ्गुलाकृष्ट उच्यते ।।
(R. R. S. 8/39)

The required quantity of 'hiṅgula' (HgS; Cinnabar) is taken in a clean khalva yantra and subjected for 7 bhāvanās each with desired quantity of 'nimbū swarasa', 'ārdraka swarasa' or 'lakuca swarasa' to purify hiṅgula.

Later the dry hiṅgula powder is taken in lower pot of a clean 'ūrdhva-pātana yantra' or 'vidyādhara yantra' and subjected for heat (boiling point of mercury 357.25$^0$ C). Wet cloth is placed over the top of upper pot. The evaporated mercury gets collected at the inner surface of the pot in tiny droplets form.

Later when complete evaporation is done, the mercury is collected from upper pot, washed and used as 'hiṅgulottha pārada' or 'hiṅgulākṛṣṭa pārada'. Pārada extracted from hiṅgula is considered purest of all forms. Therefore, it does not require any further purification or saṁskaraṇa.

### Pārada- śuddha and aśuddha swarūpa:

अन्तःसुनिलो बहिरुज्ज्वलो वा मध्याह्नसूर्यप्रतिमप्रकाशः
शस्तोऽथ धूम्रः परिपाण्डुरश्च चित्रो न योज्यो रसकर्मसिद्ध्यैः ।। (Āy. Pra.)

• Another reference:

शुद्धः सूतो यतस्त्वन्तः सुनीलो बहिरुज्ज्वलः । सूर्यप्रभश्चाविशुद्धो धूम्रो वा परिपाण्डुरः ।।
(R. T. 5/5)

The '**pure mercury**' will have a very 'clean', 'silver shiny' surface with a bluish tinge from within and a bright sunshine appearance from outside. Whereas, the '**impure mercury**' will have, 'smoky' or 'pale yellowish' colour.

### Impure mercury is hazardous:

सदोषो रसराजस्तु विदद्याद्विविधान् गदान् । तस्माद् दोषविहीनन्तु योगेषु विनियोजयेत् ।।
(R. T. 5/6)

Consumption of impure mercury will cause many diseases in the body. Therefore, only the purified mercury should be used for all the pharmaceutical preparations.

## MERCURY- OCCUPATIONAL HEALTH HAZARDS

**Signs and symptoms of exposure:**

1. Acute exposure: Acute inhalation of mercury vapor may result in toxicity similar to 'metal fume fever' including chills, nausea, general malaise, tightness in the chest, chest pains, dyspnea, cough, stomatitis, gingivitis, salivation and diarrhea.

2. Chronic exposure: Chronic exposure to mercury may result in weakness, fatigue, anorexia, weight loss, and disturbance of gastrointestinal function. A tremor may develop beginning with the fingers, eyelids, and lips which may progress to generalized trembling of the entire body and violent chronic spasms of the extremities.

Parallel with development of the tremors, behavioral and personality changes may develop including increased excitability, memory loss, insomnia, and depression. The skin may exhibit abnormal blushing, dermographia, excessive sweating and irregular circular rashes. Severe salivation and gingivitis is also characteristic of chronic toxicity.

Another manifestation of chronic mercury exposure is characterized by apathy, anorexia, flush, fever, a nephrotic syndrome with albuminuria and generalized edema, diaphoresis, photophobia, insomnia and a pruritic and sometimes painful scaling or peeling of the skin of the hands and feet with bullous lesions.

**Exposure sources and control methods:**

The following operations may involve mercury and lead to worker exposures to the vapors of mercury:

- The mining, production and transportation of mercury.
- The mining and refining operations for gold and silver ores.
- Use in thermometers, manometers, barometers, gauges and valves.
- Use in amalgams for dentistry, preservatives, heat transfer technology, pigments, catalysts and in lubricating oils.

Methods that are effective in controlling worker exposures to mercury vapor, depending on the feasibility of implementation, are as follows:

- Process enclosure.
- Local exhaust ventilation.
- General dilution ventilation.
- Personal protective equipment.

## PĀRADA DOṢA

The 'doṣa' of 'pārada' are 12 and are classified as three types. The table below displays the categorization of 'pārada doṣa' and the number and names of particular doṣa.

| **PĀRADA DOṢA (12)** | | |
|---|---|---|
| **I. Naisargika Doṣa (3)** | **II. Yougika Doṣa (2)** | **III. Aupādika Doṣa (Saptakañcuka Doṣa) (7)** |
| 1. Viṣa<br>2. Vahni<br>3. Mala | 1. Nāga<br>2. Vaṅga | 1. Parpaṭī -Bhūmija<br>2. Pāṭinī - Girija<br>3. Bhedī -Vārija<br>4. Drāvī<br>5. Malakarī<br>6. Andhakarī<br>7. Dhwāṅkṣī |

### I. Naisargika doṣa (Natural impurities):

विषं वह्निर्मलश्चेति दोषा नैसर्गिकास्त्रयः । (R. R. S. 11/20)

Mercury is a metal available in the earth, which has to be mined. Since this liquid metal has the natural tendency of digesting other metals and minerals, which come in contact, it always comes with some or the other metals mixed with it. Even the native or free mercury will not be 100 % pure.

Therefore, the metals like copper, lead, tin, zinc etc will be always present in traces in natural 'mercury'. All such trace metals are considered as the 'natural impurities' or the 'naisargika doṣa' of mercury.

### II. Yougika doṣa (Adultrated impurities):

यौगिकौ नागवङ्गौ द्वौ । (R. R. S. 11/118)

When mercury is put to trade and commercial use, it is adulterated with cheaper metals like nāga (lead) and vaṅga (tin) for more commercial gains. As a result of which the mercury available in the market comes with this kind of adulterants, which are considered as 'yougika doṣa'.

### III. Aupādhika doṣa or Saptakañcuka doṣa (Peripheral impurities):

पर्पटी पाटिनी भेदी द्रावी मलकरी तथा । अन्धकारी तथा ध्वाङ्क्षी विज्ञेयाः सप्त कञ्चुकाः ॥
(R. R. S. 11/21)

We know that the 'mercury' always comes with the natural digested impurities (naisargika doṣa). When the mercury is exposed to the atmospheric conditions for longer periods, the impurities at its surface will be oxidized. These oxidized impurities appear like a thin 'sheath of dirt' upon the mercury, masking its natural lustre. All such 'peripheral oxidized impurities', which appear as 'dirt' on the surface of 'mercury' are called by the name 'Aupādhika doṣa' or 'Saptakañcuka doṣa' (सप्त कञ्चुका: कञ्चुकवद् बहिरावरणे समा:।).

The term 'aupādhika' means 'dependent upon', since these impurities stay dependent as dirt on the surface mercury, they are called as 'aupādhika doṣa'. The term 'kañcuka' means the 'shed skin of snake'; here the impurities are compared with the dead tissue of the snake, which needs to be shed.

**Pārada doṣa and their influence over body:**

विषं वह्निर्मलश्चेति दोषा नैसर्गिकास्त्रय: । रसे मरणसन्तापमूर्च्छानां हेतव: क्रमात् ।।

(R. R. S. 11/17)

- Other reference:

नागवङ्गौ वह्निमलौ चापल्यं गरलं गिरि: । असह्याग्निश्च विज्ञेया दोषा नैसर्गिका रसे ।।
नागाद् व्रणं भवेत्कुष्ठं वङ्गात्तापोऽग्निदोषत: । मलाज्जाड्यं तु चापल्याद् बीजनाशो विषान्मृति: ।।
गिरे: स्फोटोऽथ मोहश्च ह्यसह्याग्ने प्रजायते । एतैर्दोषैर्विहीनश्च रसेन्द्रमिह योजयेत् ।। (R. T. 5/7-9)

The natural impurities present in pārada and their influence over body are shown below in the table;

| | Doṣa | Causes |
|---|---|---|
| 1 | Viṣa or garala doṣa | Mṛtyu or maraṇa (death) |
| 2 | Vahni or agni doṣa | Santāpa (rise in body temperature) |
| 3 | Mala doṣa | Jāḍya (heaviness) |
| 4 | Nāga doṣa | 'Vraṇa' (wound) |
| 5 | Vaṅga doṣa | Kuṣṭha (skin diseases) |
| 6 | Cāpalya doṣa | Śukrakṣaya (depletion of śukra) |
| 7 | Giri doṣa | Sphoṭa (boils over skin) |
| 8 | Asahyāgni doṣa | Moha (delirium) |

## PĀRADA DOṢA - DESCRIPTION

### 1) Viṣa doṣa:

Mercury is naturally exposed to many highly poisonous metals and minerals such as 'arsenic compounds' (haratāla, manaḥśilā and gourīpāṣāṇa), lead, bismuth etc in the heart of the earth.

Even these poisonous elements remain imbibed in the mercury when it is mined out and all such impurities are termed as 'viṣa doṣa', which are to be thoroughly purified.

If the mercury is administered without purification of these 'viṣa doṣa', they cause mṛtyu (death).

**2) Vahni doṣa:**

Because of the high temperature in the core of the earth, all the metals and minerals obviously melt, boil and vaporize. During this time, they remain affected by high temperature and when mined they come out with 'vahni doṣa' in them.

Vahni doṣa here is known by the natural property of these metals and minerals to cause 'dāha' (burning sensation in the body) and 'santāpa' (to cause the rise of body temperature) when administered for therapeutic purposes.

If the mercury is administered without purification of these 'vahni doṣa', they cause santāpa (rise in body temperature).

**3) Mala doṣa:**

Many of the non-poisonous metals and minerals that combine with mercury remain as 'mala' and come out with it when mined. These types of impurities are termed as 'mala doṣa' and are to be purified before the mercury is put to therapeutic use in compound formulations.

If the mercury is administered without purification of these 'mala doṣa', they cause 'jāḍya' (heaviness in the body).

**4) & 5) Nāga and Vaṅga doṣa:**

Mercury is naturally exposed to nāga (lead) and vaṅga (tin) in the heart of the earth. These poisonous elements remain imbibed in the mercury when it is mined out and are called as 'nāga and vaṅga doṣa'.

Moreover, when mercury is put to trade and commercial use, it is adulterated with cheaper metals like nāga and vaṅga for more commercial gains. Because of which the mercury available in the market comes with adulteration of nāga and vaṅga. These adulterants are to be purified before the mercury is put to therapeutic use in compound formulations.

If the mercury is administered without purification of these 'nāga and vaṅga doṣa', they cause 'vraṇa' (wound) and kuṣṭha (skin diseases) respectively.

**6) Cāpalya doṣa:**

The 'cāpalya doṣa' here is not the natural elusiveness of the mercury. It is the presence of 'capala' (bismuth; 'Bi'/selenium; 'Se') in the mercury mined out. These elements are highly poisonous and are specially termed as 'cāpalya doṣa', which needs to be purified before the mercury is put to therapeutic use in compound formulations.

If the mercury is administered without purification of this 'cāpalya doṣa', it causes 'śukrakṣaya' (depletion of śukra) in the person.

**7) Giri doṣa:**

Giri doṣa is indicative of the special impurities found in the mercury mined in mountain regions or hilly areas. The common impurity is the 'girisindūra' (Mercuric oxide; HgO) which will be available in the mountain regions.

If the mercury is administered without purification of these 'giri doṣa', they cause boils over skin (sphoṭa).

**8) Asahyāgni doṣa:**

Natural mercury when combines with 'chlorine' (a greenish, toxic, gaseous element (atomic no. 17), with high oxidizing power) and such other elements, the ability of the mercury to withstand the temperature comes down. In other words, the melting and boiling points come down and the mercury tends to evaporate at much lower temperatures. This kind of impurity in the mercury is identified as 'asahyāgni doṣa'.

If the mercury is administered without purification of this 'asahyāgni doṣa', it causes delirium (moha) in the person.

**Pārada- quantity for śodhana/saṁskaraṇa:**

> पलानां शतकं ग्राह्यं तदर्धार्धमथापि वा । पलानां दशकं वाऽपि पञ्चकं वा पलोन्मितम् ।।
> पलान्यूनो न संग्राह्यः संस्कारार्थे रसो बुधैः । बहुप्रयाससाध्यत्वाल्लाभाभावाच्च निश्चितम् ।।

(R. T. 5/17-18)

For purification, 100 pala (5 kgs), 50 pala (2.5 kgs), 25 pala (1.25 kgs), 10 pala (500 gms), 5 pala (250 gms) or at least 1 pala (50 gms) of mercury should be taken. Quantity less than 1 pala (50 gms) should not be taken.

Because, the efforts and the requirements that go into purification of any lesser quantity of mercury is same as that of any higher quantity. Therefore, wise physicians should always go for purification of higher quantities of mercury for commercial reasons.

**Pārada- quantity for śodhana/saṁskaraṇa (another reference):**

> द्वे सहस्रे पलानां तु सहस्रं शतमेव च । अष्टाविंशत् पलान्येव दश पञ्चैकमेव वा ।।
> पलार्धेनैव कर्तव्यः संस्कारः सूतकस्य च ।

(R. R. S. 11/27-28)

For the purpose of śodhana or saṁskaraṇa, 2000 pala (100 kgs), 1000 pala (50 kgs), 100 pala (5 kgs), 28 pala (1.4 kgs), 10 pala (500 gms), 5 pala (250 gms), 1 pala (50 gms) or at least half pala (25 gms) of mercury should be taken. Quantity less than half pala (25 gms) should not be taken.

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Because, the efforts and the requirements any quantity of mercury are same. Therefore, wise physicians should always go for śodhana or saṁskaraṇa of higher quantities of mercury for commercial reasons.

## PĀRADA ŚODHANA

To make the mercury free from all the above mentioned impurities (doṣa) and to make it fit and potent for therapeutic and pharmaceutical use, the purification (sāmānya and viśeṣa śodhana) of 'pārada' is most essential.

शोधनं दोषहरणं संस्कारश्च बलतेजसोऽभिवर्धनम् । (Dharaṇīdhara Saṁhitā)

The process of śodhana mitigates all types of 'doṣa' (physical as well as chemical impurities) in the doṣa. Whereas, the process of 'saṁskaraṇa' potentiates the mercury and renders it fit for all types of pharmaceutical and therapeutic purposes. The different methods of 'pārada śodhana' are given below.

**Pārada sāmānya śodhana (1st method):**

रसेश्वरं समसुधारजसा मर्दयेत् त्र्यहम् । ततो द्विगुणवस्त्रान्तर्गालितं खल्वके न्यसेत् ।।
रसोनं निस्तुषं तुल्यं तदर्धं लवणं हरेत् । तत्कल्के मर्दयेत्सूतं यावदायाति कृष्णताम् ।।
कृष्णं कल्कं परित्यज्य तथा प्रक्षाल्य युक्तितः । एवमेकेन वारेण रसेन्द्रः शुद्धिमाप्नुयात् ।।
(R. T. 5/27-29)

Requirements:

| | |
|---|---|
| 1. Pārada (mercury) | : 1 part |
| 2. Sudhā raja (fine powder of lime stone) | : 1 part |
| 3. Rasona (garlic) | : 1 part |
| 4. Saindhava lavaṇa | : Half part |
| 5. Uṣṇa jala (warm water) | : As required |

Method:

The pārada is taken in a clean khalva yantra of bigger size made of stone. It is added with equal quantity of sudhā raja (fine powder of lime stone) and triturated continuously for 3 days (per day it should be triturated for minimum 8 hours). By the end of trituration the pārada partially disappears into the lime powder in globular form. Later all the visible pārada is tactfully collected back from the mixture, washed with warm water and kept separately for further processing.

To collect the remaining unseen pārada from the lime powder, the whole mixture has to be taken in a bigger plastic bucket containing warm water. It is carefully stirred to facilitate settlement of pārada at the bottom. The upper

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water portion mixed with lime powder is decanted cautiously. This process of decantation is repeated many times by adding fresh warm water until the clear mercury is seen collected at the bottom of the bucket.

Now all the collected mercury is taken again in khalva yantra and added with equal quantity of de-husked laśuna and half quantity of saindhava lavaṇa. The process of trituration is carried out until all the mixture turns completely black in color (it may take 2 to 3 days).

Now the black mixture is again carefully washed with warm water as explained above to collect the purified pārada.

**Pārada sāmānya śodhana (2nd method):**

एकेन लशुनेनापि शुद्धो भवति पारदः । पिष्टो लवणसंयुक्तो सप्ताहं तप्तखल्वके ।।

(Āy. Pra. 1/165)

Required quantity of 'aśuddha pārada' is taken in a clean 'tapta khalva yantra', added with equal quantities of 'laśuna kalka' (garlic paste) and 'saindhava lavaṇa' and triturated for 7 days.

On 8th day, the mercury is collected from the mixture by carefully washing with warm water and later stored as 'śuddha pārada' for further pharmaceutical use.

**Pārada sāmānya śodhana (3rd method):**

कुमारिकाचित्रकरक्तसर्षपैः कृतैः कषायैर्बृहतीविमिश्रितैः ।
फलत्रिकेणापि विमर्दितो रसो दिनत्रयं सप्तमलैर्विमुच्यते ।। (R. T. 5/31)

Appropriate quantity of mercury is taken in a clean khalva yantra. It is added with 'ghṛtakumārī pulp', 'citrakamūla twak' and 'rakta sarṣapa' (each 1/16th part of mercury). The mixture is triturated with 'bṛhatī kwātha' and 'triphalā kwātha' for 3 days (8 hours per day). Later the mixture is carefully washed with water to obtain mercury free from all the 'saptakañcuka' doṣas.

**Pārada sāmānya śodhana (4th method):**

नागवल्लीदलरसैस्तथा चार्द्रकजे रसैः । क्षारत्रययुतैश्चापि रसराजं विमर्दयेत् ।।
ततस्तेभ्यः पृथक् कृत्वा सप्तदोषविवर्जितम् । मुक्ताफलसमाकारं रसराजं प्रयोजयेत् ।।

(R. T. 5/34-35)

Appropriate quantity of mercury is taken in a clean khalva yantra. It is added with 'nāgavallī rasa' (juice of betel leaves), ārdraka swarasa (juice of ginger), sarjakṣāra, yavakṣāra and ṭaṅkaṇa (each 1/16th part of mercury). The mixture is triturated for 3 days (8 hours per day). Later the mixture is carefully washed either with 'water' or with 'kāñjī' to obtain pure mercury. This mercury will be lustrous like pearl (muktā) and free from all the 'saptakañcuka' doṣas.

**Pārada sāmānya śodhana (5th method):**

> विमर्द्य सुधया सप्तदिनं धूमनिशेष्टकैः । त्रिदिनं मर्दयेत्सूतं काञ्जिकैः क्षालयेत्ततः ।।
> वस्त्रं चतुर्गुणं कृत्वा सूतं निःसारयेत्ततः । सप्तकञ्चुकनिर्मुक्तो जायते निर्मलो रसः ।।
>
> (R. T. 5/36-37)

Appropriate quantity of mercury is taken in a clean khalva yantra. It is added with equal quantity of 'sudhā cūrṇa' (lime powder) and triturated for 7 days. By the end of trituration the mercury partially disappears into the lime powder in globular form.

Later all the visible mercury is tactfully collected back from the mixture, washed with warm water and kept separately for further processing.

To collect the remaining unseen mercury from the lime powder, the whole mixture has to be taken in a bigger plastic bucket containing warm water. It is carefully stirred to facilitate settlement of mercury at the bottom.

The upper water portion mixed with lime powder is decanted cautiously. This process of decantation is repeated many times by adding fresh warm water until the clear mercury is seen collected at the bottom of the bucket.

Now all the collected mercury is taken again in khalva yantra and added with 'gṛhadhūma' (soot), 'haridrā cūrṇa' (turmeric powder) and 'iṣṭikā cūrṇa' (brick powder) each 1/16th part of mercury. The mixture is triturated for 3 days (8 hours per day).

Later the mixture is carefully washed with 'kāñji' and filtered with four-folded cloth to obtain pure mercury. This mercury will be free from all the 'saptakañcuka' doṣas.

**Pārada sāmānya śodhana (6th method):**

> गुडस्त्रिकटु यामिनी लवणपञ्चकं पावकः फलत्रिकयवाग्रजौ खलु सुवर्चिकष्टङ्कणः ।
> तथा कितवसर्षपौ खलु समैस्तु विशांशकैः विशुद्ध्यति विमर्दितो रसवरोऽश्वसंख्यैर्दिनैः ।।
> श्रीमद्गुरुमुखोद्गीतः कृतश्च बहुशो मया । अनुभूतश्च योगेषु प्रकारोऽयं निरूपितः ।।
>
> (R. T. 5/32-33)

Appropriate quantity of mercury is taken in a clean khalva yantra. It is added with 'guḍa' (jaggary), 'trikaṭu cūrṇa', 'yamānī cūrṇa', 'pañca lavaṇa' (saindhava, sauvarcala, sāmudra, viḍa and audbhida lavaṇa; each separately taken), 'citraka mūla cūrṇa', 'triphalā cūrṇa', 'yavakṣāra', 'sarjakṣāra', 'taṅkaṇa', 'dhattūra bīja' and 'sarṣapa bīja'; note that all the drugs are taken 1 part each and the total quantity of all these drugs should be 1/20th part of mercury.

The trituration is continued for 7 days (8 hours per day). Later the mixture is carefully washed with water to obtain mercury free from all the 'saptakañcuka' doṣas.

## PĀRADA- VIŚEṢA ŚODHANA

The special purification of 'pārada' is done to purify each doṣa of 'mercury' in particular. The different pharmaceutical methods employed for this purpose are as given below;

**Pārada 'nāga' doṣa śodhana:**

धूमेष्टिकाहट्टविलासिनीनां सोर्णैस्तु चूर्णैः परिमर्द्य सूतम् ।
प्रक्षालयेदम्लजलेन सम्यक् ततो रसो मुञ्चति नागदोषम् ॥ (R. T. 5/22)

For viśeṣa śodhana of 'nāga doṣa', appropriate quantity of mercury is taken in a clean khalva yantra, added with 'gṛhadhūma', 'iṣṭikā cūrṇa' (brick powder), 'haridrā cūrṇa' and 'finely cut wool of sheep' (each 1/16th part of mercury).

The mixture is added with required quantity of 'ghṛtakumārī swarasa' and triturated thoroughly for a day (8 hours). Later the mixture is carefully washed with 'kāñjī' to obtain mercury free from 'nāga doṣa'.

**Pārada 'vaṅga' doṣa śodhana:**

मृगेक्षणाङ्कोलनिशोत्थचूर्णैः सूतो जहातीह तु वङ्गदोषम् । (R. T. 5/23)

For viśeṣa śodhana of 'vaṅga doṣa', appropriate quantity of mercury is taken in a clean khalva yantra, added with 'indrāyaṇa cūrṇa', 'aṅkola cūrṇa' and 'haridrā cūrṇa' in the quantity of 1/16th part each.

The mixture is added with required quantity of 'ghṛtakumārī swarasa' and triturated thoroughly for a day (8 hours). Later the mixture is carefully washed with 'kāñjī' to obtain mercury free from 'vaṅga doṣa'.

**Pārada 'agni' and 'mala' doṣa śodhana:**

चित्रोऽग्निदोषं विनिहन्ति शीघ्रं दोषं मलोत्थं खलु राजवृक्षः ॥ (R. T. 5/23)

For viśeṣa śodhana of 'agni doṣa', appropriate quantity of mercury is taken in a clean khalva yantra, added with 'citraka mūla cūrṇa' in the quantity of 1/16th part.

For viśeṣa śodhana of 'mala doṣa', appropriate quantity of mercury is taken in a clean khalva yantra, added with 'āragwadha twak cūrṇa' in the quantity of 1/16th part.

The mixtures are added with required quantity of 'ghṛtakumārī swarasa' and triturated thoroughly for a day (8 hours). Later the mixtures are carefully washed with 'kāñjī' to obtain mercury free from 'agni doṣa' and 'mala doṣa'.

**Pārada 'cāpalya' and 'viṣa' doṣa śodhana:**

चापल्यहारी खलु कृष्णधूर्तो विषापहर्त्री त्रिफला प्रशस्ता । (R. T. 5/24)

For viśeṣa śodhana of 'cāpalya doṣa', appropriate quantity of mercury is taken in a clean khalva yantra, added with 'kṛṣṇa dhattūra pañcāṅga or bīja cūrṇa' in the quantity of 1/16th part.

For viśeṣa śodhana of 'viṣa doṣa', appropriate quantity of mercury is taken in a clean khalva yantra, added with 'triphalā cūrṇa' in the quantity of 1/16th part.

The mixtures are added with required quantity of 'ghṛtakumārī swarasa' and triturated thoroughly for a day (8 hours). Later the mixtures are carefully washed with 'kāñjī' to obtain mercury free from 'cāpaiya doṣa' and 'viṣa doṣa'.

**Pārada 'giri' and 'vahni' doṣa śodhana:**

दोषं गिरेस्त्रूषणमाशु हन्यात् त्रिकण्टको वह्न्यसहत्वदोषम् ॥ (R. T. 5/24)

For viśeṣa śodhana of 'giri doṣa', appropriate quantity of mercury is taken in a clean khalva yantra, added with 'trikaṭu cūrṇa' in the quantity of 1/16th part.

For viśeṣa śodhana of 'vahni doṣa', appropriate quantity of mercury is taken in a clean khalva yantra, added with 'gokṣura cūrṇa' in the quantity of 1/16th part.

The mixtures are added with required quantity of 'ghṛtakumārī swarasa' and triturated thoroughly for a day (8 hours). Later the mixtures are carefully washed with 'kāñjī' to obtain mercury free from 'giri doṣa' and 'vahni doṣa'.

The reference for general method adopted above to purify the particular doṣa of pārada is as given below:

चूर्णं कलांशप्रमितं तु सूतात् सकन्यकं भाषितभेषजानाम् ।
विमर्दयेत्खल्वगतं दिनैकं प्रक्षालयेच्चापि ततोऽम्लतोयैः ॥
रीत्यानया शोधित ईशसंज्ञः सत्यं भवेत्कञ्चुकदोषहीनः ।
इत्थं विशुद्धं खलु सूतराजं नियोजयेद्वैद्यवरो रसेषु ॥ (R. T. 5/25-26)

**Table for pārada viśeṣa śodhana:**

The table below enlists the drugs used for 'viśeṣa śodhana' of particular doṣas of 'pārada'.

| Sl No. | Drugs added | To purify |
|---|---|---|
| 1 | Gṛhadhūma, iṣṭikā cūrṇa (brick powder), haridrā cūrṇa and finely cut wool of sheep | Nāga doṣa |
| 2 | 'Indrāyaṇa', 'aṅkola' and 'haridrā cūrṇa' | Vaṅga doṣa |
| 3 | Citraka mūla cūrṇa | Agni doṣa |
| 4 | Āragwadha twak cūrṇa | Mala doṣa |
| 5 | Kṛṣṇa dhattūra pañcāṅga or bīja cūrṇa | Capala doṣa |
| 6 | Triphalā cūrṇa | Viṣa doṣa |
| 7 | Trikaṭu cūrṇa | Giri doṣa |
| 8 | Gokṣura cūrṇa | Asahyāgni doṣa |

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## Chapter 10

# PĀRADA AṢṬA SAṀSKĀRA

(Eight Special Procedures of Mercury)

## PĀRADA AṢṬA SAṀSKĀRA

The process of ‘pārada śodhana’ mitigates all types of ‘doṣa’ (physical as well as chemical impurities) in the doṣa. Whereas, the process of ‘saṁskaraṇa’ potentiates the mercury and renders it fit for all types of pharmaceutical and therapeutic purposes.

शोधनं दोषहरणं संस्कारश्च बलतेजसोऽभिवर्धनम् । (Dhanvantari Saṁhitā)
संस्कारो हि नाम विशेष गुणान्तराधानमुच्यते । (C. S. Vi. 1/21)

The ‘asaṁskārita śuddha pārada’ does not possess the desired potency. It needs to undergo the special procedures explained under these eight or eighteen saṁskāras. The eighteen saṁskāras of pārada are;

स्यात्स्वेदनं तदनु मर्दनमूर्च्छनञ्च उत्थापनं पतनरोधनियामनानि ।
सन्दीपनं गगनभक्षणमानमत्र सञ्चारणा तदनु गर्भगता द्रुतिश्च ।।
बाह्याद्रुतिः सूतकजारणा स्याद् ग्रासस्तथा सारणकर्म पश्चात् ।
सङ्क्रामणं वेधविधिः शरीरे योगस्तथाष्टाद्राधाऽत्र कर्म ।। (R. R. S. 11/15-16)

| **AṢṬĀDAŚA PĀRADA SAṀSKĀRA** | |
|---|---|
| **For Dehavāda** | **For Dhātuvāda** |
| 1. Swedana | 9. Anuvāsana |
| 2. Mardana | 10. Grāsamāna |
| 3. Mūrcchana | 11. Cāraṇa |
| 4. Utthāpana | 12. Garbha-dṛti |
| 5. Pātana | 13. Bāhya-dṛti |
| 6. Bodhana/Rodhana | 14. Jāraṇa |
| 7. Niyāmana | 15. Rañjana |
| 8. Dīpana | 16. Sāraṇa |
| | 17. Krāmaṇa and |
| | 18. Vedha |
| **Note:** Few authors consider ‘Bhakṣaṇa’ as 19th saṁskāra. | |

Out of these 18 types of saṁskāras, the first eight are meant for ‘dehavāda’ (potentiating the mercury for therapeutic purposes; i.e. for curing the diseases and for rasāyana and vājīkaraṇa) and the remaining 10 are meant for ‘dhātuvāda’ (conversion of lower metals into higher metals).

सूतस्यैते च संस्काराः कथिता देहकर्मणि । तथा च दश संस्कारा देहलोहकरा स्मृताः ।।

Out of these 18 saṁskāras, minimum three or maximum eight are most essential to potentiate the mercury. First three or eight saṁskāras are comparatively easy to perform but the last ten saṁskāras are rather difficult, because of the obscure methods involved.

**Pārada- quantity for śodhana/saṁskaraṇa:**

पलानां शतकं ग्राह्यं तदर्धार्धमथापि वा । पलानां दशकं वाऽपि पञ्चकं वा पलोन्मितम् ।।
पलान्यूनो न संग्राह्यः संस्कारार्थे रसो बुधैः । बहुप्रयाससाध्यत्वाल्लाभाभावाच्च निश्चितम् ।।
(R. T. 5/17-18)

For purification, 100 pala (5 kgs), 50 pala (2.5 kgs), 25 pala (1.25 kgs), 10 pala (500 gms), 5 pala (250 gms) or at least 1 pala (50 gms) of mercury should be taken. Quantity less than 1 pala (50 gms) should not be taken.

Because, the efforts and the requirements that go into purification of any lesser quantity of mercury is same as that of any higher quantity. Therefore, wise physicians should always go for purification of higher quantities of mercury for commercial reasons.

**Pārada- quantity for śodhana/saṁskaraṇa**
(another reference):

द्वे सहस्रे पलानां तु सहस्रं शतमेव च । अष्टाविंशत् पलान्येव दश पञ्चैकमेव वा ।।
पलार्धेनैव कर्तव्यः संस्कारः सूतकस्य च । (R. R. S. 11/27-28)

For the purpose of śodhana or saṁskaraṇa, 2000 pala (100 kgs), 1000 pala (50 kgs), 100 pala (5 kgs), 28 pala (1.4 kgs), 10 pala (500 gms), 5 pala (250 gms), 1 pala (50 gms) or at least half pala (25 gms) of mercury should be taken. Quantity less than half pala (25 gms) should not be taken.

Because, the efforts and the requirements any quantity of mercury are same. Therefore, wise physicians should always go for śodhana or saṁskaraṇa of higher quantities of mercury for commercial reasons.

**Pārada aṣṭa saṁskāra and their significance:**

रसायनप्रयोगेषु रसागमविशारदः । रसराजं प्रयुञ्जात कर्माष्टकविशोधितम् ।। (R. T. 5/43)

For all types of ' pārada rasāyana prayoga', only 'aṣṭa-saṁskārita pārada' should be used. The eight saṁskāras of pārada are as follows; 1. Swedana 2. Mardana 3. Mūrcchana 4. Utthāpana 5. Pātana (ūrdhva, adhaḥ and tiryak pātana) 6. Bodhana (rodhana) 7. Niyāmana and 8. Dīpana.

Since these eight saṁskāras are most useful to potentiate the mercury and render it fit for therapeutic purposes, they are explained in detail here.

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## 1. SWEDANA SAṀSKĀRA

### Aim of swedana saṁskāra:

क्षाराम्लैरौषधैर्वाऽपि दोलायन्त्रे स्थितस्य हि । पचनं स्वेदनाख्यं स्यान्मलशैथिल्यकारकम् ।।
(R. R. S. 8/62)

The aim of swedana saṁskāra is 'doṣa-śithilīkaraṇa' (loosening of the doṣas present in mercury). Here purified mercury is tied in a poṭṭalī, hung in a dolāyantra having either 'kṣārīya jala' or 'amlīya jala' as liquid media and subjected for swedana for a stipulated time.

By doing so, the doṣas present in the mercury are loosened. The below reference also reveals the same aim of 'swedana saṁskāra'.

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दोलायन्त्रे स्थापयित्वा रसेन्द्रं क्षारैरम्लैरौषधैर्वा कषायैः ।
युक्त्या यत्स्यात्पाचनं स्वेदनं तत् प्राज्ञैरुक्तं दोषशैथिल्यकारि ।। (R. T. 5/46)

### Swedana saṁskāra- 1st method:

आसुरिपटुकटुकत्रयचित्रार्द्रमूलकैः कलांशैश्च । सूतस्य काञ्जिकेन त्रिदिनं मृदुवह्निना स्वेदः ।।
(R. Hṛ.Tantra 2/3)

The fine powders/kalka of rājikā (āsurī), saindhava lavaṇa (paṭu), śuṇṭhī, marīca, pippalī, citraka, ārdraka and mūlikā (each drug; 1/16th part of mercury) are taken in a khalva yantra and triturated along with required quantity of kāñjī to prepare fine kalka. This kalka is now diluted with required quantity of kāñjī and the liquid is carefully transferred to dolāyantra. Now appropriate quantity of mercury is taken. It is carefully tied like poṭṭalī in a cloth, which is thickly applied with above prepared kalka and hung in dolāyantra.

Now the pot (dolāyantra) is cautiously placed over mild fire and boiled for three days (8 hours per day) over medium fire. Daily the dolāyantra is filled with fresh liquid media (kalka + kāñjī) and boiled. This procedure is called as 'swedana saṁskāra'. It is known to loosen the embedded/adherent doṣas present in the mercury.

### Swedana saṁskāra- 2nd method:

त्र्यूषणं लवणासुर्यौ चित्रकार्द्रकमूलकम् । क्षिप्त्वा सूतो मुहुः स्वेद्यः काञ्जिकेन दिनत्रयम् ।।
(R. R. S. 11/29)

The fine powders/kalka of śuṇṭhī, marīca, pippalī, rājikā (sūrya), saindhava lavaṇa (paṭu), citraka, ārdraka and mūlikā (each drug; 1/16th part of mercury) are taken in a khalva yantra and triturated along with required quantity of kāñjī to prepare fine kalka.

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This kalka is now diluted with required quantity of kāñjī and the liquid is carefully transferred to dolāyantra. Now appropriate quantity of mercury is taken. It is carefully tied like poṭṭalī in a cloth, which is thickly applied with above prepared kalka and hung in dolāyantra.

Now the pot (dolāyantra) is cautiously placed over mild fire and boiled for three days (8 hours per day) over medium fire. Daily the dolāyantra is filled with fresh liquid media (kalka + kāñjī) and boiled. This procedure is called as 'swedana saṁskāra'. It is known to loosen the embedded/adherent doṣas present in the mercury.

**Swedana saṁskāra- 3rd method:**

त्र्यूषणं मूलकासुर्यौ पटुकार्द्रकवह्नयः । तत्कल्कैः काञ्जिके सूतं स्वेदयेद्दिवसत्रयम् ।। (R. T. 5/49)

The fine powders/kalka of śuṇṭhī, marīca, pippalī, saindhava lavaṇa, rājikā, mūlikā, ārdraka and citraka (vahni) (each drug; 1/16th part of mercury) are taken in a khalva yantra and triturated along with required quantity of kāñjī to prepare fine kalka.

This kalka is now diluted with required quantity of kāñjī and the liquid is carefully transferred to dolāyantra. Now appropriate quantity of mercury is taken. It is carefully tied like poṭṭalī in a cloth, which is thickly applied with above prepared kalka and hung in dolāyantra.

Now the pot (dolāyantra) is cautiously placed over mild fire and boiled for three days (8 hours per day) over medium fire. Daily the dolāyantra is filled with fresh liquid media (kalka + kāñjī) and boiled. This procedure is called as swedana saṁskāra. It is known to loosen the embedded/adherent doṣas present in the mercury.

## 2. MARDANA SAṀSKĀRA

**Aim of mardana saṁskāra:**

उदितैरौषधैः सार्धं सर्वाम्लैः काञ्जिकैरपि। पेषणं मर्दनाख्यं स्याद्बहिर्मलविनाशनम्।। (R. R. S. 8/63)

Trituration of 'swedita pārada' in a clean khalva yantra with any of the suitable 'amla dravya' or 'kāñjī' is called as 'mardana saṁskāra'. This saṁskāra is known to eradicate the 'bāhya-mala' (sapta-kañcuka doṣa) of mercury. The below reference also reveals the same aim of 'mardana saṁskāra'.

क्षाराद्यैरोषधैर्वा यत् खल्वे सूतस्य पेषणम् । तन्मर्दनं बुधैः प्रोक्तं बहिर्मलनिवृत्तये ।। (R. T. 5/54)

**Mardana saṁskāra- 1st method:**

गुडदग्धोर्णालवणैर्मन्दिरधूमेष्टिकासुरीसहितैः । रसषोडशांशमानैः सकाञ्जिकैर्मर्दनं त्रिदिनम् ।।

(R. Hṛ.Tantra 2/4)

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The fine powders/kalka of guḍa (jaggary), dagdhorṇa (burnt cotton), saindhava lavaṇa, gṛha-dhūma (mandira-dhūma), iṣṭikā cūrṇa (brick powder) and rājikā (āsurī), (each drug; 1/16th part of mercury) are taken in a khalva yantra and triturated along with 'swedita pārada' for 3 days (8 hours per day).

After 3rd day, the mercury is carefully washed with warm water, filtered through a clean cloth and collected back from kalka. This procedure is called as mardana saṁskāra and it is known to eradicate the 'bāhya-mala' (sapta-kañcuka doṣa) of mercury.

### Mardana saṁskāra- 2nd method:

सैन्धवं सदनधूम आसुरी यामिनी लशुनमार्द्रकं वरा ।
षोडशांशमिह निक्षिपेद्रसान्मर्दयेद्रसवरं दिनत्रयम् ।। (R. T. 5/55)

The fine powders/kalka of saindhava lavaṇa, gṛha-dhūma (sadana-dhūma), rājikā (āsurī), haridrā (yamānī), laśuna, ārdraka and triphalā (each drug; 1/16th part of mercury) are taken in a khalva yantra and triturated along with 'swedita pārada' for 3 days (eight hours per day).

After 3rd day, the mercury is carefully washed with warm water, filtered through a clean cloth and collected back from kalka. This procedure is called as mardana saṁskāra and it is known to eradicate the 'bāhya-mala' (sapta-kañcuka doṣa) of mercury.

### Mardana saṁskāra- 3rd method:

इष्टिकाचूर्णकं सैन्धवं यामिनी गेहधूमो गुडश्चासुरी नागरम् ।
षोडशांशं क्षिपेत्सर्वमेतद्रसान्मर्दयेत् पारदं वासराणां त्रयम् ।। (R. T. 5/56)

The fine powders/kalka of iṣṭikā (brick powder), saindhava lavaṇa, haridrā (yamānī), gṛha-dhūma, guḍa (jaggary), rājikā (āsurī) and śuṇṭhī (nāgara); (each drug; 1/16th part of mercury) are taken in a khalva yantra and triturated along with 'swedita pārada' for 3 days (eight hours per day).

After 3rd day, the mercury is carefully washed with warm water, filtered through a clean cloth and collected back from kalka. This procedure is called as mardana saṁskāra and it is known to eliminate the 'bāhya-mala' (sapta-kañcuka doṣa) of mercury.

## 3. MŪRCCHANA SAṀSKĀRA

### Aim of mūrcchana saṁskāra:

मर्दनाऽऽदिष्टभैषज्यैर्नष्टपिष्टत्वकारकम्। तन्मूर्च्छनं हि वङ्गादिभूजकञ्चुकनाशनम्।। (R. R. S. 8/64)

The specific pharmaceutical procedures, which convert the mercury from its natural form (cañcalatwa and durgrāhyatwa) to 'piṣṭa' or 'kalka' form (acañcala and sugrāhya) is known as mūrcchana saṁskāra.

Here 'mardita pārada' is triturated thoroughly in a clean khalva yantra along with the specified medicinal drugs. The trituration removes, 'vaṅga doṣa', 'nāga doṣa' and 'saptakañcuka doṣa' of mercury. During the process, the mercury loses its natural form and attains 'naṣṭapiṣṭatwa' (paste like consistency).

**Naṣṭapiṣṭa lakṣaṇa:**

स्वरूपस्य विनाशेन पिष्टत्वाद्बन्धनं हि तत् । विद्वद्भिर्निर्जितः सूतो नष्टपिष्टः स उच्यते ।।

(R. R. S. 8/66)

Eminent people in the field call eradicating the original form of 'mercury' and bringing it in the form of kalka as 'naṣṭapiṣṭatwa'. Here the 'capalatwa' and 'cañcalatwa'—the natural properties of mercury are eradicated by subjecting it to the different pharmaceutical procedures like swedana and mardana.

**Mūrcchana saṁskāra- 1st method:**

गृहकन्या हरति मलं, त्रिफलाग्नि, चित्रकश्च विषम् । तस्मादेभिर्मिश्रैर्वारान् सम्मूर्च्छयेत्सप्त ।।

(R. Hṛ.Tantra 2/6)

The desired quantity of 'mardita pārada' is taken in a clean khalva yantra and triturated along with 'ghṛtakumārī', 'triphalā' and 'citraka' to alleviate 'mala', 'vahni' and 'viṣa' doṣa respectively (each drug is taken 1/16th part of mercury).

The mercury is subjected to 7 bhāvanās with each of the above said drugs. After each bhāvanā, the mercury is washed with 'kāñjī' and subjected again for another bhāvanā. All these bhāvanās alleviate 'saptakañcuka' doṣas in mercury and eventually it attains kalka (piṣṭa) form.

**Mūrcchana saṁskāra- 2nd method:**

गृहकन्या मलं हन्यात् त्रिफला वह्निनाशिनी । चित्रमूलं विषं हन्ति तस्मादेभिः प्रयत्नतः ।।
मिश्रितं सूतकं द्रव्यैः सप्तवाराणि मूर्च्छयेत् । इत्थं सम्मूर्च्छितः सूतो दोषशून्यः प्रजायते ।।

(R. R. S. 11/34-35)

The desired quantity of 'mardita pārada' is taken in a clean khalva yantra and triturated along with 'ghṛtakumārī', 'triphalā' and 'citraka' to alleviate 'mala', 'vahni' and 'viṣa' doṣa respectively (each drug is taken 1/16th part of mercury).

The mercury is subjected to 7 bhāvanās with each of the above said drugs. After each bhāvanā, the mercury is washed with 'kāñjī' and subjected again for another bhāvanā. All these bhāvanās alleviate all the doṣas in mercury and eventually it attains kalka (piṣṭa) form.

### Mūrcchana saṁskāra- 3rd method:

कुमारिका मलं हन्ति, वरा दहननाशिनी । चित्रमूलं विषं हन्ति तस्मादेभिः प्रयत्नतः ।।
मर्दितं सूतकं द्रव्यैः सप्तवाराणि मूर्च्छयेत् । एवं सम्मूर्छितः सूतो दोषैः सर्वैः प्रमुच्यते ।।
(R. T. 5/59-60)

The desired quantity of 'mardita pārada' is taken in a clean khalva yantra and triturated along with 'ghṛtakumārī', 'triphalā' and 'citraka' to alleviate 'mala', 'vahni' and 'viṣa' doṣa respectively (each drug is taken 1/16th part of mercury).

The mercury is subjected to 7 bhāvanās with each of the above said drugs. After each bhāvanā, the mercury is washed with 'kāñjī' and subjected again for another bhāvanā. All these bhāvanās alleviate all the doṣas in mercury and eventually it attains kalka (piṣṭa) form.

## 4. UTTHĀPANA SAṀSKĀRA

### Aim of utthāpana saṁskāra:

स्वेदातपादियोगेन स्वरूपापादनं हि यत्। तदुत्थापनमित्युक्तं मूर्च्छाव्यापत्तिनाशनम्।। (R. R. S. 8/65)

After first three saṁskāras (swedana, mardana and mūrcchana), the mercury losses its natural form (cañcalatwa and durgrāhyatwa) and attains 'piṣṭa' (kalka) form. The specific pharmaceutical procedure carried out to regain the lost natural form of the mercury is called as utthāpana saṁskāra. The below reference also reveals the same aim of 'utthāpana saṁskāra'.

स्वेदाद्यैर्यद्रसेन्द्रस्य मूर्च्छाव्यापत्तिनाशनम् । पुनः स्वरूपकरणं तदुत्थापनमीरितम् ।। (R. T. 5/63)

### Utthāpana saṁskāra- 1st method:

अमुना विरेचनेन विशुद्धो नागवङ्गपरिमुक्तः ।
सूतः पातनयन्त्रे समुत्थितः काञ्जिकक्वाथात् ।। (R. Hṛ.Tantra 2/7)

The desired quantity of 'mūrchita pārada', which is free from nāga and vaṅga doṣa is subjected for 'pātana' (distillation) in 'pātana yantra' or it is added with 'uṣṇa kāñjī' and stirred well or it is cooked with 'kāñjī' for a while. Later the mercury is collected and used as 'utthāpita pārada'.

### Utthāpana saṁskāra- 2nd method:

अस्माद्विरेकात्संशुद्धो रसः पात्यस्ततः परम् । उद्धतः काञ्जिकक्वाथात् पूतिदोषनिवृत्तये ।।
(R. R. S. 11/36)

The desired quantity of 'mūrchita pārada' (mercury obtained after mūrchana saṁskāra) is taken in a 'ḍamaru yantra', placed over moderate fire and heated to evaporate the mercury.

Later when the yantra is cool on its own, the mercury adhered at the base of the upper pot as droplets is collected, washed with 'kāñjī' and used as 'utthita pārada'. This procedure removes the 'pūti doṣa' of pārada.

**Utthāpana saṁskāra- 3rd method:**

अथवा काञ्जिकेनैव रसेन्द्रं स्वेदयेद् बुधः । अम्लैः प्रक्षालयेत्सम्यगुत्थितो रसराड् भवेत् ॥
(R. T. 5/66)

The desired quantity of 'mūrchita pārada' (mercury obtained after mūrchana saṁskāra) is carefully tied in a poṭṭalī and suspended in a 'dolā-yantra' containing any of the 'kāñjī' as liquid media.

Now the pot (dolāyantra) is cautiously placed over mild fire and boiled for three days (8 hours per day). Daily the dolāyantra is filled with fresh liquid media and boiled.

At the end, the mercury is washed with any of the 'amla dravya' and collected. This procedure eradicates the 'mūrcchitāvasthā' of the mercury and brings back its lost natural form. All this procedure is referred as utthāpana saṁskāra.

**Utthāpana saṁskāra- 4th method:**

रसेन्द्रं काञ्जिकेनेह याममात्रं विमर्दयेत् । सलिलैः क्षालयेत्सम्यगुत्थितो जायते रसः ॥ (R. T. 5/67)

The desired quantity of 'mūrchita pārada' (mercury obtained after mūrchana saṁskāra) is taken in a clean khalva yantra. It is added with required quantity of 'kāñjī' and triturated for 3 days. Later the mixture is washed with warm water to obtain 'utthita pārada' (mercury in its natural form).

## 5. PĀTANA SAṀSKĀRA

**Aim of pātana saṁskāra:**

उक्तौषधैर्मर्दितपारदस्य यन्त्रस्थितस्योर्ध्वमधश्च तिर्यक् ।
निर्यातनं पातसंज्ञमुक्तं वङ्गाहिसंपर्कजकञ्चुकघ्नम् ॥ (R. R. S. 8/67)

The pharmaceurical process in which, the mercury (utthita pārada) is triturated with specified drugs and subjected for 'pātana' (distillation) in 'ūrdhwa', 'adhaḥ' or 'tiryak' pātana yantra is called as 'pātana saṁskāra'. Here the mercury gets rid of 'nāga' (Pb) and 'vaṅga' (Sn) doṣa. The below reference also reveals the same aim of 'pātana saṁskāra'.

उक्तौषधै रसवरस्य विमर्दितस्य यन्त्राहितस्य यदिहोर्ध्वमधश्च तिर्यक् ।
निष्कासनं तदिह पातनसंज्ञमुक्तं वंगाहिदोषयुगलं शमयत्यनल्पम् ॥ (R. T. 5/69)

### • ŪRDHWA-PĀTANA

**Ūrdhwapātana saṁskāra- 1st method:**

कृत्वा तु शुल्बपिष्टिं निपात्यते नागवङ्गशङ्कातः । तस्मिन्दोषान्मुक्त्वा निपतति शुद्धस्तथा सूतः ॥
(R. Hṛ.Tantra 2/8)

Even after all the earlier saṁskāra, doubting the presence of nāga and vaṅga doṣa, one parts of 'utthita pārada' (mercury obtained after utthāpana saṁskāra) is taken in a clean khalva yantra along with 1/4th part of 'śuddha tāmra cūrṇa' and triturated along with desired quantity of 'jambīra nimbū rasa' to obtain the whole mixture in homogenous kalka form.

This kalka is now taken in the lower pot of the 'ūrdhwa-pātana yantra' and subjected for intense heat for a day and allowed to cool down overnight. Next morning the pots are cautiously unsealed. The mercury, which is deposited in droplet format at the base of the upper pot, is carefully scraped and collected, later filtered and stored as 'ūrdhwa pātita pārada'. It will be free from all types of doṣa.

**Ūrdhwapātana saṁskāra- 2nd method:**

ताम्रेण पिष्टिकां कृत्वा पातयेदूर्ध्वभाजने । वङ्गनागौ परित्यज्य शुद्धो भवति सूतकः ।।
शुल्वेन पातयेत्पिष्टीं त्रिधोर्ध्वं सप्तधा त्वधः ।। (R. R. S. 11/37-38)

One parts of 'utthita pārada' is taken in a clean khalva yantra along with 1/4th part of 'śuddha tāmra cūrṇa' and triturated to obtain the amalgam. This amalgam is now taken in the lower pot of the 'ūrdhwa-pātana yantra' and subjected for intense heat for a day and allowed to cool down overnight.

Next morning the pots are cautiously unsealed. The mercury, which is deposited in droplet format at the base of the upper pot, is carefully scraped and collected. All this process is repeated for 7 times. After 7th time 'ūrdhwa-pātana', the mercury is collected, filtered and stored as 'ūrdhwa pātita pārada'. It will be free from all types of doṣa.

**Ūrdhwapātana saṁskāra- 3rd method:**

त्रयो भागा ग्राह्याः खलु रसवरस्येह विबुधैः रवेश्चैको भागो विधिविहितशुद्धिः कृतदलः ।
समं सर्वं मर्द्यं भृशमिह हि जम्बीररसजैः रसः पाक्यो युक्त्या खलु डमरुयन्त्रे वुधवरैः ।।
(R. T. 5/74)

The 3 parts of 'utthita pārada' (mercury obtained after utthāpana saṁskāra) is taken in a clean khalva yantra along with 1 part of 'śuddha tāmra cūrṇa' and triturated. The mixture is now added with desired quantity of 'jambīra nimbū' rasa and triturated to obtain the whole mixture in homogenous kalka form.

This kalka is now taken in the lower pot of the 'ḍamaru yantra' (find in 4th chapter) and subjected for intense heat for a day and allowed to cool down overnight. Next morning the pots are cautiously unsealed. The mercury, which is deposited in droplet format at the base of the upper pot, is carefully scraped and collected, later filtered and stored as 'ūrdhwa pātita pārada'.

### • ADHAḤ-PĀTANA

**Adhaḥpātana saṁskāra- 1st method:**

> कृत्वा च नष्टपिष्टिं त्रिफलाशिखिशिग्रुराजिकापटुभिः । संलेप्य चोर्ध्वभाण्डे दीप्तैकपलैरधःपात्यः ॥
> (R. Hṛ.Tantra 2/12)

One part of 'utthita pārada' (mercury obtained after utthāpana saṁskāra) is taken in a clean khalva yantra. It is added with the fine powder of 'harītakī', 'vibhītakī', 'citrakamūla twak', 'śīgru bīja' 'rājikā' and 'saindhava lavaṇa' (each 1/16th part of mercury) and triturated to obtain the whole mixture in homogenous kalka form.

This kalka is now applied at the base of the upper pot in 'adhaḥ-pātana yantra'. The yantra is subjected to intense heat for a day by heaping up the dry cow dung cakes around the upper pot (kukkuṭa puṭa).

It is later allowed to cool overnight on its own. Next morning the pots are cautiously unsealed. The mercury, which is collected in the water at the base of the lower pot, is collected after decanting all the water. It is later filtered and stored as 'adhaḥ pātita pārada'. This 'pārada' will be free from all types of 'doṣa'.

**Adhaḥpātana saṁskāra- 2nd method:**

> त्रिफला शिग्रुशिखिभिर्लवणासुरिसंयुतैः । नष्टपिष्टं रसं कृत्वा लेपयेच्चोर्ध्वभाजने ॥
> ततो दीप्तैरधःपातमुत्पलैस्तत्र कारयेत् ॥ (R. R. S. 11/39)

One part of 'utthita pārada' (mercury obtained after utthāpana saṁskāra) is taken in a clean khalva yantra. It is added with the fine powder of 'harītakī', 'vibhītakī', 'āmalakī', 'śīgru', 'citrakamūla', 'saindhava lavaṇa' and 'rājikā' (each 1/16th part of mercury) and triturated.

The mixture is now added with desired quantity of any 'amla dravya' (kāñjī, jambīra nimbū rasa etc) and triturated to obtain the whole mixture in homogenous kalka form. This kalka is now applied at the base of the upper pot in 'adhaḥ-pātana yantra'. The yantra is subjected to intense heat for a day by heaping up the dry cow dung cakes around the upper pot (kukkuṭa puṭa).

It is later allowed to cool overnight on its own. Next morning the pots are cautiously unsealed. The mercury, which is collected in the water at the base of the lower pot, is collected after decanting all the water. It is later filtered and stored as 'adhaḥ pātita pārada'.

### Adhaḥpātana saṁskāra- 3rd method:

हरीतकी बिभीतकं तथासुरी च सैन्धवम् । शिखी च शिग्रुजः समैः समैः सुपेषयेद्रसम् ।।
यदा स नष्टपिष्टतामियात्तदा भिषग्वरः । निरुक्तयन्त्रवर्त्मना रसं निपातयेदधः ।।
(R. T. 5/78-79)

One part of 'utthita pārada' (mercury obtained after utthāpana saṁskāra) is taken in a clean khalva yantra. It is added with the fine powder of 'harītakī', 'vibhītakī', 'rājikā', 'saindhava lavaṇa', 'citraka' and 'śigru bīja' (1 part each) and triturated.

The mixture is now added with desired quantity of any 'amla dravya' (kāñjī, jambīra nimbū rasa etc) and triturated to obtain the whole mixture in homogenous kalka form. This kalka is now applied at the base of the upper pot in 'adhaḥ-pātana yantra' (find in 4th chapter). The yantra is subjected to intense heat for a day by heaping up the dry cow dung cakes around the upper pot.

It is later allowed to cool overnight on its own. Next morning the pots are cautiously unsealed. The mercury, which is collected in the water at the base of the lower pot, is collected after decanting all the water. It is later filtered and stored as 'adhaḥ pātita pārada'.

## • TIRYAK-PĀTANA

### Tiryak pātana saṁskāra- 1st method:

उद्दिष्टैरौषधैः साकं रसराजं सुपेषयेत् । तिर्यक्पातनयन्त्रे च गृह्णीयान्निर्मलं रसम् ।। (R. T. 5/80)

The desired quantity of 'utthita pārada' (mercury obtained after utthāpana saṁskāra) is taken in a clean khalva yantra. It is added with the fine powders/ kalka of specified drugs (each drug is taken 1/16th part of mercury) and triturated for 3 days to obtain the mixture in kalka form.

This kalka is now taken in the still (pot placed at higher level) of the 'tiryak-pātana yantra' (find in 4th chapter) and subjected for intense heat. The mercury, evaporates, passes through the nāḍī (pipe connecting both the pots; or the condenser) and trickles down in the receiver (lower pot containing water). When cool on its own, the lower pot is carefully unsealed and the mercury inside is collected, filtered and stored as 'tiryak pātita pārada'.

### Tiryak pātana saṁskāra- 2nd method:

तिर्यक्पातनविधिना निपातितः सूतराजश्चः । श्लक्ष्णीकृतमभ्रदलं रसेन्द्रयुक्तं तथाऽऽरनालेन ।।
खल्वे दत्त्वा मृदितं यावत्तन्नष्टपिष्टतामेति । कुर्यात्तिर्यक् पातनपातितसूतं क्रमेण दृढवह्निम् ।।
संस्वेद्यः पात्योऽसौ न पतति यावद्दृढश्चाग्नौ । तदाऽसौ शुद्ध्यते सूतः कर्मकारी भवेद्ध्रुवम् ।।
(R. R. S. 11/44-46)

One part of 'utthita pārada' is taken in a clean khalva yantra. It is added with the 'dhānyābhraka cūrṇa' (1/4th part) and triturated rigorously to obtain the mixture in kalka form.

This kalka is now taken in the still (pot placed at higher level) of the 'tiryak-pātana yantra' and subjected for intense heat. The mercury, evaporates, passes through the nāḍī (pipe connecting both the pots as condenser) and trickles down in the receiver (lower pot containing water). When cool on its own, the lower pot is carefully unsealed and the mercury inside is collected.

The mercury obtained is subjected for 'swedana' in 'dolā yantra' for a day. It is again triturated with 'dhānyābhraka cūrṇa' and processed in 'tiryak-pātana yantra'. This process of 'swedana' and 'tiryak-pātana' is repeated until the 'pārada' attains the ability to withstand the heat and stops vaporizing.

Later the mercury is filtered and stored as 'tiryak pātita pārada'. This mercury will be free from all the doṣas and comes with high therapeutic values.

Note: 'Rasahṛdaya Tantra 2/13-15' mentions the same verse of 'Rasaratna Samuccaya'.

### 6. BODHANA (RODHANA OR NIRODHANA) SAṀSKĀRA

**Aim of bhodhana saṁskāra:**

मर्दनादिकयोगेन जातक्लैब्यस्य शूलिनः । क्लैब्यापहं तु यत्कर्म बोधनं कथ्यते बुधैः ।।

(R. T. 5/81)

Mercury after undergoing all the earlier saṁskāras (swedana, mardana, mūrcchana, utthāpana and pātana), attains a kind of temporary therapeutic impotency (klaibyatwa or napuṁsakatā). To eradicate this impotency a specific pharmaceutical procedure is carried out on mercury, which is called the 'bodhana or rodhana saṁskāra'.

**Bodhana saṁskāra- 1st method:**

जलसैन्धवयुक्तस्य रसस्य दिवसत्रयम् । स्थितिरास्थापनी कुम्भे याऽसौ रोधनमुच्यते ।।

(R. R. S. 8/68)

Required quantity of 'saline water' (water added with little quantity of saindhava lavaṇa) is taken in a suitable sized mud pot. In this, the 'poṭṭalī' of pātita pārada put. It is allowed to be in that water for three days.

On 4th day, the mercury is collected back, washed with warm water and stored. All this procedure is called as 'rodhana saṁskāra'. It alleviates the therapeutic impotency (ṣaṇḍhatwa) of the mercury and adds additional potency to it.

### Bodhana saṁskāra- 2nd method:

सृष्ट्यम्बुजैर्निरोधेन ततो मुखकरो भवेत् । स्वेदनादिवशात्सूतो वीर्यं प्राप्नोत्यनुत्तमम् ।।

(R. R. S. 11/48)

The 'pātita pārada' is kept immersed in 'sṛṣṭyambu' (saline water) or it is subjected for 'swedana' in 'dolāyantra' containing 'sṛṣṭyambu'. Both these procedures are called as 'rodhana saṁskāra'. This alleviates the therapeutic impotency (ṣaṇḍhatwa) of the mercury and adds additional potency to it.

- **Sṛṣṭyambu:**

सृष्ट्यम्बुजम् अरुग्णाया: षोडशवार्शिक्या: स्त्रिया रज: । तदुक्तं शक्त्यवतारे– गोऽजाऽविनरनारीणां मूत्रं शुक्रं च शोणितम् ।

(Āy. Pra. 1/88-89 ṭikā)

Sṛṣṭyambu is believed to be the menstrual flow of a healthy 16 years aged girl. Many other authors consider the mūtra, śukra and ārtava as 'sṛṣṭyambu'. Here 'ambuja' is 'saindhava lavaṇa', therefore, some other authors consider 'sṛṣṭyambu' as saline water.

### Bodhana saṁskāra- 3rd method:

मर्दनमूर्च्छनपातै: कदर्थितो भवति मन्दवीर्यत्वात् । सृष्ट्यम्बुजैर्निरोधाल्लब्धाप्यायो न षण्ढ: स्यात् ।।

(R. Hṛ.Tantra 2/9)

Mercury after undergoing all the earlier saṁskāras (swedana, mardana, mūrcchana, utthāpana and pātana), attains 'mandavīryatwa' (low potency). To eradicate this, the 'poṭṭalī' of pātita pārada is placed in required quantity of 'saline water' for three days.

On 4th day, the mercury is collected back, washed with warm water and stored. All this procedure is called as 'rodhana saṁskāra'. It alleviates the therapeutic impotency (mandavīryatwa) of the mercury and improves its appetite.

### Bodhana saṁskāra- 4th method:

जलसैन्धवसूतपूरितां क्षितिगर्ते खलु काचकूपिकाम् ।
विनिधाय दिनत्रयं ततो गतषाण्ढ्य: सबलो रसो भवत् ।।

(R. T. 5/84)

The 'pātita pārada' is filled up to 1/4th of a long necked glass bottle. The remaining bottle is filled with saline water (water added with little quantity of saindhava lavaṇa) and the bottle is properly sealed. This bottle is now buried in a pit (dug in the ground) for 3 days. The pit should be long enough to hide the complete bottle.

After three days, the mercury is collected back, washed with warm water and stored. All this procedure alleviates the therapeutic impotency (ṣaṇḍhatwa) of the mercury and adds additional potency to it.

### 7. NIYĀMANA SAṀSKĀRA

**Aim of niyāmana saṁskāra:**

रोधनाल्लब्धवीर्यस्य चपलत्वनिवृत्तये । क्रियते पारदे स्वेदः प्रोक्तं नियमनं हि तत् ।।

(R. R. S. 8/69)

After 'bodhana saṁskāra', the mercury attains high therapeutic potency along with 'cāpalya doṣa' (dugrāhyatwatā; elusiveness). To eradicate this 'cāpalya doṣa', the pharmaceutical procedure (swedana) carried out on 'bodhita pārada' is known as 'niyāmana saṁskāra'. The below reference also reveals the same aim of 'niyāmana saṁskāra'.

बोधनाल्लब्धवीर्यस्य रसस्य स्वेदनं हि यत्। चापल्यविनिवृत्त्यर्थं तन्नियामनमीरितम्।। (R. T. 5/87)

**Niyāmana saṁskāra- 1st method:**

मरिचैर्भूखगयुक्तैर्लवणासुरिशिग्रुटङ्कणोपेतैः । काञ्जिकयुक्तैस्त्रिदिनं ग्रासार्थी जायते स्वेदात् ।।

(R. R. S. 11/50)

The fine powders/kalka of marīca, bhūnāga, saindhava lavaṇa, rājikā (āsurī), śigru and ṭaṅkaṇa (each 1/16th part of mercury) are taken in a khalva yantra and triturated along with required quantity of kāñjī to prepare fine kalka.

This kalka is thickly applied over a cloth. In it, appropriate quantity of 'bodhita pārada' is placed, tied as poṭṭalī and hung in dolāyantra containing kāñjī as liquid media.

Now the pot (dolāyantra) is cautiously placed over mild fire and boiled for three days (8 hours per day) over moderate fire. Daily the dolāyantra is filled with fresh kāñjī and boiled. This procedure is called as 'niyāmana saṁskāra'. This saṁskāra, eradicate the 'cāpalya doṣa' in 'bodhita pārada' and improve its appetite.

**Niyāmana saṁskāra- 2nd method:**

इति लब्धवीर्यः सम्यक् चपलोऽसौ संनियम्यते तदनु ।
फणिलशुनाम्बुजमार्कवकर्कोटीचिञ्चिकास्वेदात् ।।

(R. Hṛ.Tantra 2/17)

To control the excessive 'capalatwa' of 'bodhita pārada', the fine powders/kalka of laśuna (phaṇinaya), saindhava lavaṇa (ambuja), mārkava (bhṛṅgarāja), kārkoṭī (Cucumis melo) and ciñcā (tamarind); (each drug; 1/16th part of mercury) are taken in a khalva yantra and triturated along with required quantity of kāñjī to prepare fine kalka.

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This kalka is thickly applied over a cloth. In it, appropriate quantity of 'bodhita pārada' is placed, tied as poṭṭalī and hung in dolāyantra containing kāñjī as liquid media.

Now the pot (dolāyantra) is cautiously placed over mild fire and boiled for three days (8 hours per day) over moderate fire. Daily the dolāyantra is filled with fresh kāñjī and boiled. This procedure is called as 'niyāmana saṁskāra'.

**Niyāmana saṁskāra- 3rd method:**

नियामकगणोद्दिष्टैः समस्तव्यस्तभेषजैः । पूर्वदर्शितमार्गेण भिषक् कुर्यान्नियामनम् ।। (R. T. 5/90)

The desired quantity of mercury (bodhita pārada), is carefully tied as a 'poṭṭalī' in 'bhūrja patra' (Betula utilis) and suspended in dolāyantra containing swarasa/kwātha of 'niyamaka gaṇa dravya' (mentioned below) considered either individually or together in equal ratio.

The pot (dolāyantra) is cautiously placed over mild fire and boiled for 1 yāma (3 hours). At the end, the mercury is washed with warm water, filtered and collected. This saṁskāra, eradicate the 'cāpalya doṣa' in 'bodhita pārada'.

**Niyāmaka gaṇa:**

महाबला नागबला यमचिञ्चा पुनर्नवा । आखुपर्णी सहचरा वासिका काकमाचिका ।।
गोक्षुरः शरपुङ्खा च विष्णुक्रान्ता घनध्वनिः । मण्डूकपर्णी तुलसी बला च गिरिकर्णिका ।।
शतावरी शङ्खपुष्पी श्वेतार्कः कनकाह्वयः । चक्रमर्दः करञ्जश्च ब्रह्मदण्डी शिखण्डिनी ।।
गुडूची सैन्धवं पाठा मृगाक्षी सोमवल्लिका । नियामकगणो ह्येष प्रोक्तो रसविशारदैः ।।
(R. T. 5/91-94)

Mahābalā (sahadevī), nāgabalā (gaṅgerukī), yamaciñcā (apakwa amlikā), punarnavā, ākhuparṇī, sahacara, vāsā, kākamācī, gokṣura, śarapuṅkha, viṣṇukrāntā (aparājitā), ghanadhwani (taṇḍulīyaka), kṛṣṇa tulasī, balā, girikarṇikā (kṛṣṇa aparājitā), śatāvarī, śaṅkhapuṣpī, śweta puṣpārka, dhattūra (kanaka), cakramarda, karañja, brahmadaṇḍī (Butea monosperma), śikhaṇḍinī (vandyā kārkoṭī), guḍūcī, saindhava lavaṇa, pāṭhā, indravāruṇī (mṛgākṣī), somavallikā (matsyākṣī); all these are included under the heading '**niyāmaka gaṇa**' by experts in the field of Rasaśāstra. These drugs are useful in many pharmaceutical procedures of pārada.

## 8. DĪPANA SAṀSKĀRA

### Aim of dīpana saṁskāra:

दोलायन्त्रे स्थापयित्वा रसेन्द्र क्षाराद्यैर्यत्पाचनं स्याद्यथायम् ।
ग्रासार्थी वा जारणे च प्रगल्भः शास्त्रज्ञैस्तद्दीपनं सम्प्रदिष्टम् ।। (R. T. 5/95)

The pharmaceutical procedure carried out on 'niyāmita pārada' (mercury collected after niyāmana saṁskāra), that boosts up the appetite (bhubhūkṣita) of mercury is known as 'dīpana saṁskāra'. Here the mercury attains that extra hunger to digest the metals and minerals in it.

Here, the desired quantity of mercury (niyāmita pārada), is carefully tied as a 'poṭṭalī' in 'bhūrja patra' (Betula utilis) and suspended in dolāyantra containing any of the kṣāra or amla dravya.

The pot (dolāyantra) is cautiously placed over mild fire and boiled for 3 days. At the end, the mercury is washed with warm water, filtered and collected. All this procedure is called as 'dīpana saṁskāra'.

**Dipana saṁskāra- 1st method:**

भूखगटङ्कणमरिचैर्लवणासुरिशिग्रुकाञ्जिकै स्त्रिदिनम्। स्वेदेन दीपितोऽसौ ग्रासार्थी जायते सूतः।।

(R. Hṛ.Tantra 2/11)

The fine powders/kalka of bhūnāga, ṭaṅkaṇa, marīca, saindhava lavaṇa, rājikā (āsurī) and śīgru (each 1/16th part of mercury) are taken in a khalva yantra and triturated along with required quantity of kāñjī to prepare fine kalka.

This kalka is thickly applied over a cloth. In it, appropriate quantity of 'niyāmita pārada' is placed, tied as poṭṭalī and hung in dolāyantra containing kāñjī as liquid media.

Now dolāyantra is cautiously placed over mild fire and boiled for three days (8 hours per day) over moderate fire. Daily the dolāyantra is filled with fresh kāñjī and boiled. This procedure is called as 'dīpana saṁskāra'. it improve its appetite of mercury.

**Dīpana saṁskāra- 2nd method:**

स्वेदयेदासवाम्लेन सहितं याममात्रकम् । भिषग्वरः सूतराजं शीघ्रं वीर्यविवृद्धये ।। (R. T. 5/98)

The desired quantity of niyāmita pārada, is carefully tied as a 'poṭṭalī' in 'bhūrja patra' (Betula utilis) and suspended in dolāyantra containing only 'kāñjī' as liquid media.

The pot (dolāyantra) is cautiously placed over mild fire and boiled for one prahara (3 hours). At the end, the mercury is washed with warm water, filtered and collected. This procedure is called as 'dīpana saṁskāra'. By doing so, the mercury attains that extra hunger to digest the metals and minerals in it.

## Dipana saṁskāra- 3rd method:

अथवा दहनक्वाथैस्त्रिदिनं काञ्जिके पचेत् । एवं संस्वेदितः सूतो ग्रासार्थी जायते परम् ।।

(R. T. 5/99)

The desired quantity of mercury (niyāmita pārada), is carefully tied as a 'poṭṭalī' in 'bhūrja patra' (Betula utilis) and suspended in dolāyantra containing 'citraka kwātha' (dahana kwātha) and 'kāñjī' in equal ratio as liquid media.

The pot (dolāyantra) is cautiously placed over mild fire and boiled for 3 days (8 hours per day). At the end, the mercury is washed with warm water, filtered and collected. This procedure is called as 'dīpana saṁskāra'. By doing so, the mercury attains that extra hunger to digest the metals and minerals in it.

## Pārada aṣṭa saṁskāra and their benefits in tabular form:

| Pārada aṣṭa saṁskāra | Benefits |
|---|---|
| 1. Swedana | मल/दोष शैथिल्यकरणम् ।<br>Loosening of the impurities in mercury. |
| 2. Mardana | बहिर्मलविनाशनम् ।<br>Loosening of peripheral oxidized impurities. |
| 3. Mūrcchana | नष्टपिष्टत्वकारकम् ।<br>Destroying the natural form of mercury and bringing it in kalka form. |
| 4. Utthāpana | मूर्च्छाव्यापत्तिनाशनम् ।<br>Regaining the lost form of mercury. |
| 5. Pātana | वङ्गादिसंपर्ककञ्चुकघ्नम् ।<br>Alleviating the nāga, vaṅga and such other remaining impurities. |
| 6. Bodhana/Rodhana | क्लैब्यापहं ।<br>To remove the therapeutic impotency attained by mercury after all the earlier saṁskāra. |
| 7. Niyāmana | चपलत्वनिवृत्तये ।<br>To control the excessive 'capalatā' gained by mercury after 'bodhana saṁskāra'. |
| 8. Dīpana | दीपितोऽसौ/शीघ्रं वीर्यविवृद्धये ।<br>Improving the appetite and potency of mercury. |

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## Chapter 11
# PĀRADA GATI AND BANDHA

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## PĀRADA GATI

**Pārada gati- definition:**

The inevitable loss in the 'quantity of mercury' due to various reasons while subjecting it to different pharmaceutical procedures is called as 'pārada gati'.

The term 'gati' originates from the root word '*gamḷṛu*' (dhātu), which has the root meanings like 'calana', 'gamana' or 'cañkramaṇa'; which are indicative of the movement away. Since the mercury here is lost while processing, the term 'gati' is used.

The loss in the quantity of mercury can be seen due to inexperience of the person carrying out the pharmaceutical procedures, use of inappropriate instruments (yantra), improper sealing in the instruments, application of excessive heat during 'agni-saṁskaraṇa' or due to hastiness in the procedures.

The loss of mercury due to all the above quoted reasons can be easily prevented with some appropriate measures in place, along with proper care, caution and experience.

But, despite of all the measures, care, caution and plenty of experience, the loss of mercury in smaller quantities becomes unavoidable during different pharmaceutical procedures of mercury like swedana (steaming), mardana (trituration), prakṣālana (washing), pātana (distillation) etc.

It has been documented by experts in the field that only 1/8th part out of one part of mercury remains (*aṣṭamāṁśāvaśiṣyate*) after subjecting it for all the eight special procedures (aṣṭa-saṁskāraṇa). The loss is also seen during the 'sāmānya and viśeṣa śodhana' of pārada.

The different ways of loss in mercury during various pharmaceutical procedures are as explained below;

**Pārada gati- types:**

> जलगो जलरूपेण त्वरितो हंसगो भवेत् । मलगो मलरूपेण सधूमो धूमगो भवेत् ॥
> अन्या जीवगतिर्दैवी जीवोऽण्डादिव निष्क्रमेत् । स तांश्च जीवयेज्जीवांस्तेन जीवो रसः स्मृतः ॥

(R. R. S. 1/81-82)

The different types of 'pārada gati' are as shown in the table below;

| Pārada gati | Ways of loss |
|---|---|
| **1. Jala gati** | जलगो जलरूपेण<br>Loss of mercury through water during 'jala-saṁskaraṇa' or while washing. Here, minute segregated droplets of mercury float upon the water and vanishes. |
| **2. Haṁsa gati** | त्वरितो हंसगो भवेत्<br>Loss of mercury during trituration or while transferring of mercury from one vessel to the other. Here, the mercury droplets often jump or fly off like white swans (haṁsa); especially during hasty procedures. |
| **3. Mala gati** | मलगो मलरूपेण<br>Loss of mercury along with the impurities (naisargika doṣa, yougika doṣa and saptakañcuka doṣa) present in it, during its sāmānya and viśeṣa śodhana. |
| **4. Dhūma gati** | सधूमो धूमगो भवेत्<br>Loss of mercury in the form of fumes during 'agni-saṁskaraṇa'. Especially during 'gandhaka jāraṇa' the fumes of mercury escape along with the fumes of 'gandhaka' resulting in 'dhūma gati'. |
| **5. Jīva gati** | अन्या जीवगतिर्दैवी जीवोऽण्डादिव निष्क्रमेत् ।<br>Loss as obscure as that of 'life' (jīva or prāṇa) leaving the body after death. |

**Pārada gati- visible and invisible:**

चतस्रो गतयो दृश्या अदृश्या पञ्चमी गतिः । मन्त्रध्यानादिना तस्य रुध्यते पञ्चमी गतिः ।।
इति भिन्नगतित्वाच्च सूतराजस्य दुर्लभः । संस्कारस्तस्य भिषजा निपुणेन तु रक्षयेत् ।।
(R. R. S. 1/83-84)

Out of five 'pārada gati' mentioned above, the loss of mercury in first four (jala gati, mala gati, haṁsa gati and dhūma gati) is visible to the naked eyes. These four types of 'mercury loss' can be prevented to a greater extent with good practical experience and by having the correct measures in place. However, 100% prevention of loass is not possible.

When it comes to fifth gati of pārada i.e. 'jīva gati', the loss of mercury is invisible and obscure (difficult to understand). The second line of the above verse claims that the loss through 'jīva gati' can be prevented by 'mantra' (chanting) and 'dhyāna' (meditation). However, the chanting and meditation have less practical significance and do not assure the prevention of mercury loss through 'jīva gati'.

It is very difficult to prevent the loss of mercury through all the above mentioned 'pārada gati' during its 'sāmānya and viśeṣa śodhana' and first eight or all 18 types of 'saṁskaraṇa'. Therefore, the experienced physicians who venture into this should take all the possible measures to prevent the loss of mercury.

### 1. Jala gati:

At the end of each pharmaceutical procedure carried out upon 'pārada', the mercury needs to be washed thoroughly with water or with other specified liquids. During these washes, the mercury that has attained minute droplet form due to rigorous trituration, floats upon the water and vanishes.

This loss can be prevented with utmost care taken while washing. Another practical measure that can be adopted here is, all the mercury-washed water should be collected in a vessel and cooked to evaporate the water content. The mercury left out is added to the earlier washed mercury sample.

### 2. Haṁsa gati:

During the pharmaceutical procedures that include mardana (trituration) of mercury or while transferring it from one vessel to the other, the segregated minute droplets of mercury often jump out or fly off, especially more when the procedure is hastily done.

This swift jumping or flying action of silvery and shiny mercury droplets is compared with the swift jumping or flying action of white swans (haṁsa) and the term 'haṁsa gati' is given to it. This loss also can be prevented with utmost care taken during these procedures.

### 3. Mala gati:

To free the mercury from different types of impurities (naisargika doṣa, yougika doṣa and sapta kañcuka doṣa), the pharmaceutical procedures of 'sāmānya and viśeṣa śodhana' are carried out upon mercury.

During these procedures, some amount of mercury is also lost along with the impurities. This loss is termed as 'mala gati' of pārada. This loss can be prevented with enough practical experience and proper care taken during these procedures.

### 4. Dhūma gati:

During the pharmaceutical procedures that include 'agni-saṁsakaraṇa', especially during 'pātana saṁskāra' of pārada or during 'gandhaka jāraṇa', the mercury is lost in the form of 'fumes'. These fumes of mercury more often escape along with the fumes of 'gandhaka' and the loss in the quantity of mercury will be seen.

This loss is termed as 'dhūma gati' of pārada. This 'dhūma gati' can be largely prevented by application of appropriate temperature and by bringing in more sophistication into the pharmaceutical procedures.

**5. Jīva gati:**

The invisible and obscure (difficult to understand) loss of mercury during its different pharmaceutical procedures is known as 'jīva gati'. This loss is beyond the earlier four types of 'pārada gati'. Here the loss of mercury is neither visible nor explicable and it will not be possible for us to take any pragmatic measures to prevent the loss.

The classics claim that the loss through 'jīva gati' can be prevented by 'mantra' (chanting) and 'dhyāna' (meditation). However, the chanting and meditation have less practical significance and do not assure the prevention of mercury loss through this 'gati'.

## RASA BANDHA

**Rasa bandha- definition:**

येन येन हि चाञ्चल्यं दुर्ग्रहत्वं च नश्यति । रसराजस्य सम्प्रोक्तो बन्धनार्थो हि वार्तिकैः ॥
(R. R. S. 11/60)

The act of removing the natural 'cañcalatā' (shiftiness), capalatā (evasiveness) and 'durgrāhyatā' (elusiveness) in the mercury through various pharmaceutical procedures is called as 'rasa bandha'.

The rasa or pārada after bandhana is called as 'baddha rasa'. This baddha rasa loses its natural form (liquid) and attains solid form (kalka), which will be free form 'cañcalatā', capalatā and 'durgrāhyatā'. There are 26 types of 'rasa bandha' explained in classics, which will be elaborated further.

**Rasa bandha- types:**

हठारोटौ तथाऽऽभासः क्रियाहीनश्च पिष्टिका । क्षारः खोटश्च पोटश्च कल्कबन्धश्च कज्जलि ॥
सजीवश्चैव निर्जीवो निर्बीजश्च सबीजकः । शृङ्खलाद्रुतिबन्धौ च बालकश्च कुमारकः ॥
तरुणश्च तथा वृद्धो मूर्तिबद्धस्तथाऽपरः । जलबन्धोऽग्निबन्धश्च सुसंस्कृतकृताभिधः ॥
महाबन्धाभिधश्चेति पञ्चविंशतिरीरिताः । (R. R. S. 11/61-63)

**Jaloukā bandha as 26th bandha according to few:**

केचिद्वदन्ति षड्विंशो जलूकाबन्धसंज्ञकः । स तावन्नेष्यते देहे स्त्रीणां द्रावेऽतिशस्यते ॥
(R. R. S. 11/64)

The types of 'rasa bandha' are;

1. Haṭha bandha
2. Āroṭa bandha
3. Ābhāsa bandha
4. Kriyāhīna bandha
5. Piṣṭikā bandha
6. Kṣāra bandha
7. Khoṭa bandha
8. Poṭa bandha
9. Kalka bandha
10. Kajjalī bandha
11. Sajīva bandha
12. Nirjīva bandha
13. Nirbīja bandha
14. Sabīja bandha
15. Śṛṅkhalā bandha
16. Dṛti bandha
17. Bālaka bandha
18. Kumāra bandha
19. Taruṇa bandha
20. Vṛddha bandha
21. Mūrti bandha
22. Jala bandha
23. Agni bandha
24. Susaṁskṛta bandha
25. Mahā bandha and
26. Jaloukā bandha

### 1. Haṭha bandha:

हठो रसः स विज्ञेयः सम्यक् शुद्धिविवर्जितः । स सेवितो नृणां कुर्यान्मृत्युं वा व्याधिमुद्धतम् ।।

(R. R. S. 11/65)

The 'bandha' of 'pārada' performed using 'unpurified mercury' is known as 'haṭha bandha'. This bandha is not meant for therapeutic purposes. If administered in any dosage or form, it brings death or else causes deadly diseases to the human body.

### 2. Āroṭa bandha:

सुशोधितो रसः सम्यगारोट इति कथ्यते । स क्षेत्रीकरणे श्रेष्ठः शनैर्व्याधिविनाशनः ।।

(R. R. S. 11/66)

The 'bandha' of 'pārada' performed using 'purified mercury' is known as 'āroṭa bandha'. Āroṭa baddha pārada is believed to a best medicine for 'kṣetrīkaraṇa' (refer paribhāṣā chapter). When used judiciously for internal administration, it cures many chronic ailments.

### 3. Ābhāsa bandha:

पुटितो यो रसो याति योगं मुक्त्वा स्वभावताम् । भावितो धातुमूलाद्यैराभासो गुणवैकृतेः ।।

(R. R. S. 11/67)

Śuddha pārada when processed along with desired ratios of selected 'dhātu bhasma' (incinerated metals) or with 'herbal drugs' and subjected for 'puṭa' (agni-saṁskaraṇa), it loses its natural form and attains 'kalka swarūpa'. This bandhana of mercury is called as 'ābhāsa bandha'. There are no specifications on the therapeutic utility of this bandha, instead this bandha causes vikṛti (diseases).

dr.keshav_raj

### 4. Kriyāhīna bandha:

असंशोधितलोहाद्यैः साधितो यो रसोत्तमः । क्रियाहीनः स विज्ञेयो विक्रियां यात्यपथ्यतः ।।
(R. R. S. 11/68)

The 'bandha' of 'pārada' performed using 'purified mercury' along with 'unpurified metals' is known as 'kriyāhīna bandha'. It has been said in the verse that, if 'apathya' is done, during administration of this 'baddha pārada', it causes more harm than good. This means, observing strict pathya during the administration of 'kriyāhīna baddha' pārada is of utmost significance.

### 5. Piṣṭikā bandha:

तीव्रातपे गाढतरावमर्दात्पिष्टी भवेत्सा नवनीतरूपा ।
ख्यातः स सूतः किल पिष्टिबद्धः सन्दीपनः पाचनकृद्विशेषात् ।। (R. R. S. 11/69)

Śuddha pārada is taken in a clean khalva yantra and triturated rigorously with force under hot sun until the mercury attains butter like 'piṣṭa' consistency. This is called 'piṣṭikā bandha'. This 'piṣṭikā baddha' pārada when administered judiciously for therapeutic purposes, it improves the appetite and digestion.

### 6. Kṣāra bandha:

शङ्खशुक्तिवराटाद्यैर्योऽसौ संसाधितो रसः । क्षारबन्धः परं दीप्तिपुष्टिकृच्छूलनाशनः ।।
(R. R. S. 11/70)

The 'pārada bandhana' done by triturating the 'purified mercury' with the bhasma of 'śaṅkha', 'śukti', 'varāṭikā' and such other drugs (added in desired ratios) is called as 'kṣāra bandha'.

This 'kṣāra baddha pārada' when administered judiciously for therapeutic purposes, it improves the appetite, nourishes the body and cures 'udara śūla' (abdominal pain).

### 7. Khoṭa bandha:

बन्धो यः खोटतां याति ध्मातो ध्मातः क्षयं व्रजेत् । खोटबन्धः स विज्ञेयः शीघ्रं सर्वगदापहः ।।
(R. R. S. 11/71)

The 'pārada bandhana' that facilitates to roll the mercury in the form of 'pills' and enables the pills to withstand high temperatures; such a bandha is called as 'khoṭa bandha'. This 'khoṭa baddha pārada' is useful in all the disease conditions when judiciously used.

### 8. Poṭa bandha or Parpaṭī bandha:

द्रुतकज्जलिका मोचापत्रके चिपिटीकृता । स पोटः पर्पटी सैव बालाद्यखिलरोगनुत् ।।
(R. R. S. 11/72)

Kajjalī prepared using 'śuddha pārada' and 'śuddha gandhaka' is taken in an iron tablespoon, melted over moderate fire and poured upon a ghee smeared 'banana leaf' (moca patra) placed over wet cow dung (gomaya). Soon it is pressed with a ghee smeared 'gomaya poṭṭalī' (cow dung tied in a banana leaf) to obtain a flake like dry medicine.

This is known as 'poṭa bandha' or 'parpaṭī bandha'. When used judiciously for therapeutic purposes, it cures all types of disease conditions from childhood to old age.

**9. Kalka bandha:**

स्वेदाद्यैः साधितः सूतः पङ्कत्वं समुपागतः । कल्कबद्धः स विज्ञेयो योगोक्तफलदायकः ॥

(R.R. S. 11/73)

Because of 'swedana' and 'mardana' saṁskāra, when 'śuddha pārada' attains the consistency of a kalka (paste), it is called as 'kalka bandha'. Its use in many compound formulations makes them more efficacious.

**10. Kajjali bandha:**

कज्जली रसगन्धोत्था सुश्लक्ष्णा कज्जलोपमा । तत्तत् योगेन संयुक्ता कज्जलीबन्ध उच्यते ॥

(R. R. S. 11/74)

When desired ratios of 'śuddha pārada' and 'śuddha gandhaka' are taken in a clean khalva yantra and triturated thoroughly to obtain a jet-black coloured non-lustrous fine powder called 'kajjalī'. This is called as 'kajjalī bandha'. Its use in many compound formulations makes them more efficacious.

**11. Sajiva bandha:**

भस्मीकृतो गच्छति वह्नियोगाद् रसः सजीवः खलु सम्प्रदिष्टः ।
संसेवितोऽसौ न करोति भस्मकार्यं जवाद्रोगविनाशनं च ॥

(R. R. S. 11/75)

The 'pārada bhasma' (incinerated mercury), which burns with fumes when put on fire, is identified as 'sajīva baddha pārada bhasma'. This bhasma neither fulfils the standard criteria of bhasma nor is useful for any therapeutic purposes.

**12. Nirjiva bandha:**

जीर्णाभ्रको वा परिजीर्णगन्धो भस्मीकृतश्चाखिललोहमौलिः ।
निर्जीवनामा हि स भस्मसूतो निःशेषरोगान्विनिहन्ति सद्यः ॥

(R. R. S. 11/76)

The 'śuddha pārada' is initially subjected for 'jāraṇa' with 'śuddha abhraka' and 'śuddha gandhaka' and only later incinerated to obtain 'pārada bhasma'. This 'pārada bhasma' is called as 'nirjīva bandha'. When judiciously used, it is useful in all types of disease conditions.

### 13. Nirbija bandha:

रसस्तु पादांशसुवर्णजीर्णः पिष्टीकृतो गन्धकयोगतश्च ।
तुल्यांशगन्धैः पुटितः क्रमेण निर्बीजनामा सकलामयघ्नः ॥ (R. R. S. 11/77)

The 'śuddha pārada' is initially subjected for 'jāraṇa' with 1/4th part of 'śuddha swarṇa'. Later it is added with equal quantity of 'śuddha gandhaka' and triturated to obtain the mixture in kalka (piṣṭi) form.

This kalka is weighed and the same quantity of 'śuddha gandhaka' is taken separately. Half of this śuddha gandhaka powder is placed in a clean 'śarāva', over that the above prepared kalka is placed and covered with remaining gandhaka powder. Now this 'śarāva' is closed with another one and sealed to prepare 'śarāva sampuṭa'.

This 'śarāva sampuṭa' is subjected for suitable 'puṭa' to prepare bhasma of the content. This bhasma is called as 'nirbīja bandha' of pārada. When judiciously used, it is useful in all types of disease conditions.

### 14. Sabīja bandha:

पिष्टीकृतैरभ्रकसत्त्वहेमतारार्ककान्तैः परिजारितो यः ।
हतस्ततः षड्गुणगन्धकेन स बीजबद्धो विपुलप्रभावः ॥ (R. R. S. 11/78)

The 'śuddha pārada' is subjected for 'jāraṇa' with 'abhraka sattva', 'śuddha swarṇa', 'śuddha rajata', 'śuddha tāmra' and 'śuddha kānta loha'. The obtained 'piṣṭi' of pārada is added with six parts of 'śuddha gandhaka' and triturated to obtain the mixture in kalka form.

This kalka is enclosed in a 'śarāva sampuṭa' and subjected for suitable 'puṭa' to obtain bhasma. This bhasma is called as 'sabīja bandha' of pārada. When judiciously used, it is widely useful for therapeutic purposes.

### 15. Śṛṅkhalā bandha:

वज्रादिनिहतः सूतो हतः सूतः समोऽपरः । श्रृङ्खलाबद्धसूतस्तु देहलोहविधायकः ॥
चित्रप्रभावां वेगेन व्याप्तिं जानाति शङ्करः ॥ (R. R. S. 11/79)

One part of 'pārada bhasma' incinerated with the help of 'vajrādi ratna' and one part of 'pārada bhasma' incinerated by the drugs other than ratna are mixed homogenously. This mixture is called as 'śṛṅkhalā bandha' of pārada.

Śṛṅkhalā baddha pārada is believed to be useful in both 'dehavāda' and 'dhātuvāda'. This, when administered judiciously as medicine, it acts swiftly and produces wonderful influences (prabhāva) over body.

### 16. Druti bandha:

युक्तोऽपि बाह्यद्रुतिभिश्च सूतो बन्धं गतो वा भसितस्वरूपः ।
स राजिकापादमितो निहन्ति दुस्साध्यरोगान्द्रुतिबद्धनामा ।। (R. R. S. 11/80)

After 'bāhyadṛti saṁskaraṇa' of 'pārada', if its 'bandhana' or 'bhasmīkaraṇa' (incineration) is done, the obtained kalka or the bhasma of mercury will be called as 'druti baddha pārada'. This 'druti baddha pārada' if consumed in the dosage of 1/4th part of a 'sarṣapa', it cures all types of chronic ailments.

### 17. Bālaka bandha:

समाभ्रजीर्णः शिवजस्तु बालः संसेवितो योगयुतो जवेन ।
रसायनो भाविगदापहश्च सोपद्रवारिष्टगदान्निहन्ति ।। (R. R. S. 11/81)

The 'śuddha pārada' is subjected for 'jāraṇa' with equal quantity of 'abhraka sattva', and later subjected for suitable 'puṭa' to obtain bhasma. This bhasma is called as 'bāla baddha' or 'bālaka baddha' pārada.

When judiciously administered with suitable adjuvant, 'bāla baddha pārada' acts as a good rejuvenator and helps in prevention of diseases. It can cure the diseases along with its 'upadrava' and 'ariṣṭa lakṣaṇa'.

### 18. Kumāra bandha:

हरोद्भवो यो द्विगुणाभ्रजीर्णः स स्यात्कुमारो मिततण्डुलोऽसौ ।
त्रिःसप्तरात्रैः खलु पापरोगसंघातघाती च रसायनश्च ।। (R. R. S. 11/82)

The 'śuddha pārada' is subjected for 'jāraṇa' with double quantity of 'abhraka sattva', and later subjected for suitable 'puṭa' to obtain bhasma. This bhasma is called as 'kumāra baddha pārada'.

When judiciously administered for three weeks in the dosage of one 'taṇḍula' (rice grain), this 'kumāra baddha pārada' acts as a good rejuvenator and cures all types of 'kuṣṭha' and other skin ailments (pāpa roga).

### 19. Taruṇa bandha:

चतुर्गुणव्योमकृताशनोऽसौ रसायनाग्रयस्तरुणाभिधानः ।
स सप्तरात्रात्सकलामयघ्नो रसायनो वीर्यबलप्रदाता ।। (R. R. S. 11/83)

The 'śuddha pārada' is subjected for 'jāraṇa' with four parts of 'abhraka sattva', and later subjected for suitable 'puṭa' to obtain bhasma. This bhasma is called as 'taruṇa baddha pārada'.

When judiciously administered for three weeks in suitable dosage, this 'taruṇa baddha pārada' acts as the best rejuvenator. It cures all types of diseases, improves virility and physical strength.

**20. Vṛddha bandha:**

यस्याभ्रकः षड्गुणितो हि जीर्णः प्राप्ताग्निसख्यः स हि वृद्धनामा ।
देहे च लोहे च नियोजनीयः शिवादृते कोऽस्य गुणान्प्रवक्ति ।। (R. R. S. 11/84)

The 'śuddha pārada' is subjected for 'jāraṇa' with six parts of 'abhraka sattva', and later subjected for suitable 'puṭa' to obtain bhasma. This bhasma is called as 'vṛddha baddha pārada'. When judiciously administered, this 'vṛddha baddha pārada' is useful in both 'dehavāda' and 'dhātuvāda'.

**21. Mūrti bandha:**

यो दिव्यमूलिकाभिश्च कृतोऽत्यग्निसहो रसः । विनाभ्रजारणात्स स्यान्मूर्तिबन्धो महारसः ।।
अयं हि जार्यमाणस्तु नाग्निना क्षीयते रसः । योजितः सर्वयोगेषु निरौपम्यफलप्रदः ।।
(R. R. S. 11/85-86)

Without subjecting the mercury for 'abhraka jāraṇa', if the 'bandhana' of 'śuddha pārada' is done with the help of 'divyauṣadhis' (selected herbal drugs), it will be called as 'mūrti baddha pārada'.

This 'mūrti baddha pārada' is known to have the more thermo-stability as it does not undergo any change even after continuous heat exposure. When administered judiciously, this medicine in different compound formulations produces wonderful results in the body.

**22. Jala bandha:**

शिलातोयमुखैस्तोयैर्बद्धोऽसौ जलबन्धवान् । स जरारोगमृत्युघ्नः कल्पोक्तफलदायकः ।।
(R. R. S. 11/87)

When 'pārada bandhana' is carried out with 'śilodaka' or 'śila toya' or with any other special 'water', it will be called as 'jala baddha pārada'. This 'jala baddha pārada' will be useful in the geriatric ailments. Its judicious use can postpone the death. It is believed to be a sure shot medicine for many disease conditions.

**23. Agni bandha:**

केवलो योगयुक्तो वा ध्मातः स्याद्गुटिकाकृतिः । अक्षीणश्चाग्निबद्धोऽसौ खेचरत्वादिकृत्स हि ।।
(R. R. S. 11/88)

After 'bandhana of pārada' done by mercury alone or along with any other medicinal drug/drugs with the help of 'agni' (heat), the obtained 'baddha pārada' will be made in the form of many pills. These pills, which exhibit the optimum thermo-stability, are called as 'agni baddha pārada'. This medicine is believed to provide 'khecarī' (moving in the sky) power to man.

### 24. Susaṁskṛta bandha:

विष्णुक्रान्ताशशिलताकुम्भीकनकमूलकैः । विशालानागिनीकन्दव्याघ्रपादीकुरुण्टकैः ।।
वृश्चिकालीभशुण्डीभ्यां हंसपाद्यासहासुरः । अप्रसूतगवां मूत्रैः पिष्टं वा कुलके पचेत् ।।
पक्वमेवं मृतैर्लोहैर्मर्दितं विपचेद्रसम् । यन्त्रेषु मूर्च्छा सूतानामेष कल्पः समासतः ।।

(R. R. S. 11/89-91)

The kalka or fine powder of viṣṇukrānta, śaśilatā (somalatā), jalakumbhī, kanaka mūla (dhattūra mūla), viśālā (indrāyaṇa), nāginī kanda (lakṣmaṇa kanda), vyāghra (vikaṅkata), piyāvāsa, vṛścikālī (a grass variety), hastiśuṇḍī, haṁsapadī, mudgaparṇī and āsurī (rājikā); of all these drugs is triturated in a khalva yantra along with young cow's urine to prepare kalka bolus.

This kalka bolus is subjected for proper 'pāka' in 'vālukā yantra'. Later it is triturated with selected 'dhātu bhasma' and subjected for suitable 'puṭa' to obtain 'susaṁskṛta baddha pārada'.

### 25. Mahā bandha:

हेम्ना वा रजतेन वा सहचरो ध्मातो व्रजत्येकताम्अक्षीणो निबिडो गुरुश्च गुटिकाकारोऽतिदीर्घोज्ज्वलः।
चूर्णत्वं पटुवत्प्रयाति निहतो घृष्टो न मुञ्चेन्मलम् निर्गन्धो द्रवति क्षणात्स हि महाबन्धाभिधानो रसः।।

(R. R. S. 11/92)

Desired ratios of 'śuddha swarṇa' and 'śuddha rajata' are digested in 'śuddha pārada' to obtain a good amalgam. This amalgam is now enclosed in a 'śarāva sampuṭa' and subjected for proper heat to obtain 'mahā baddha pārada'.

This 'mahā baddha pārada' does not lose its weight when subjected to heat and melted; it will be dense (nibiḍa) and heavy (guru); it stays in solid consistency (guṭikākāra); remains lustrous for very long time; when hit hard, it becomes powdery like salt (brittle); when rubbed in a rough surface does not leave any mark; melts easily when heated; and exhibits no odour; such a 'baddha pārada' is called as 'mahā baddha pārada'.

### 26. Jaloukā bandha:

सूते गर्भनियोजितार्धकनके पादांशनागेऽथवा पञ्चाङ्गुष्ठकशाल्मलीकृतमदाश्लेष्मातबीजैस्तथा ।
तद्वत्तेजिनिकोलकाख्यफलजैश्चूर्णं तिलं पत्रकं तप्ते खल्लतले निधाय मृदिते जाता जलूका वरा ।।

(R. R. S. 11/93)

One part of 'śuddha pārada' is subjected for 'jāraṇa' with half part of 'śuddha swarṇa' or quarter part of 'śuddha nāga'. Later, the obtained 'pārada' is taken in a clean tapta khalva yantra, added with 1/16th part each of 'eraṇḍa bīja', 'śālmalī bīja', 'vijayā bīja' (bhāṅga), śleṣmātaka bīja, jyotiṣmati bīja, badara phala majjā, tila (sesame), patraka (tejapatra) and triturated to obtain a homogenous mixture.

This mixture is further triturated with required quantity of 'śālmalī twak swarasa' to prepare a 'jaloukā' (leach) shaped structure. This is called 'jaloukā bandha'. This 'bandha' is not used for any therapeutic purposes, whereas, it used as a 'sex tool' for inducing sexual desire and early orgasm in women.

**Pārada bandha - Tabular representation:**

| | Name of the bandha | Short description | Benefits |
|---|---|---|---|
| 1. | Haṭha bandha | Aśuddha pārada bandhana | Cause diseases if consumed |
| 2. | Āroṭa bandha | Śuddha pārada bandhana | Cures many diseases |
| 3. | Ābhāsa bandha | Śuddha pārada bandhana with herbal drugs | Cause diseases if consumed |
| 4. | Kriyāhīna bandha | Śuddha pārada bandha with aśuddha dhātu | Cause diseases in case of apathya |
| 5. | Piṣṭikā bandha | Śuddha pārada bandha under hot sun | Dīpana and pācana |
| 6. | Kṣāra bandha | Śuddha pārada bandha with bhasma of śaṅkha, śukti, varāṭikā etc | Dīpana, pācana and śūlaghna |
| 7. | Khoṭa bandha | Śuddha pārada bandha in the form of 'pills' that withstand high temperature | Useful in all the diseases |
| 8. | Poṭa bandha | Prepared like kajjalī | Useful in all the diseases |
| 9. | Kalka bandha | Paṅkavat pārada after swedana | Useful in all the diseases |
| 10. | Kajjalī bandha | Samāna gandhaka baddha śuddha pārada | Useful in all the diseases |
| 11. | Sajīva bandha | Pārada bhasma bandha that burns in fire | No therapeutic utility |
| 12. | Nirjīva bandha | Abhraka or gandhaka jīrṇa baddha pārada | Useful in all the diseases |
| 13. | Nirbīja bandha | Swarṇa jārita, gandhaka baddha pārada piṣṭi and bhasma | Useful in all the diseases |
| 14. | Sabīja bandha | Abhraka sattva, swarṇa, rajata, tāmra, loha jāraṇa followed by 'ṣaḍguṇa' jāraṇa | Quick acting and useful in all the diseases |
| 15. | Śṛṅkhalā bandha | Ratna bhasma/piṣṭi baddha pārada | For both dehavāda & lohavāda |

| | Name of the bandha | Short description | Benefits |
|---|---|---|---|
| 16. | Dṛti bandha | Bāhyadṛti baddha pārada | Asādhya rogahara |
| 17. | Bālaka bandha | Samābhra jārita pārada | Prevents diseases and cures roga-upadrava |
| 18. | Kumāra bandha | Dwiguṇābhra jārita pārada | Cures kuṣṭha and other skin diseases |
| 19. | Taruṇa bandha | Caturguṇābhra jārita pārada | Cures all diseases in 7 days |
| 20. | Vṛddha bandha | Ṣaḍguṇābhra jārita pārada | Sarvakarmopayogī |
| 21. | Mūrti bandha | Divyauṣadha baddha, thermostatic mercury (without abhraka jāraṇa) | Rasāyana (rejuvenator) |
| 22. | Jala bandha | Śilātoya baddha pārada | Rasāyana (rejuvenator) |
| 23. | Agni bandha | Pārada bandhana with the help of agni | Rasāyana (rejuvenator) |
| 24. | Susaṁskṛta bandha | Divyauṣadha (viṣṇukrāntādi) baddha and dhātuyoga bhasmīkṛta pārada | Rasāyana (rejuvenator) |
| 25. | Mahā bandha | Dravadhātu bandha pārada, which is dense (nibiḍa), heavy (guru), ujjwala (lustrous) and brittle | Rasāyana (rejuvenator) |
| 26. | Jaloukā bandha | Śuddha pārada bandhana with herbal drugs, brought in the shape of a leach | Used as a 'sex tool' to induce early orgasm in women |

⁂

Chapter 12

# JĀRAṆA

## JĀRAṆA SAṀSKĀRA

### Jāraṇa- introduction:

The term 'jāraṇa' emanates from the root word 'jīrṇana', which means 'to digest'. Here in 'jāraṇa', mercury is made to digest the other selected purified metals and minerals in different ratios with the intent of boosting up its potency and therapeutic utility.

Mercury whether it is purified (śuddha), extracted from hiṅgula (hiṅgulottha) or subjected for eight saṁskāras ('aṣṭa saṁskārita), it is not going to have the complete therapeutic potency in it.

This cent per cent therapeutic strength in mercury can be obtained only after digestion (jāraṇa) of purified sulphur (śuddha gandhaka) in it in different ratios.

The digestion (jāraṇa) of 'gandhaka' in 'mercury' ranges from 1:1 ratio to 1:6 ratio; i.e. one part of mercury with either one, two, three, four, five or six times of 'śuddha gandhaka'.

More the ratio of gandhaka digested in mercury better will be its therapeutic strength and wider will be its therapeutic application. The mercury digested with six times of 'śuddha gandhaka', not only gains therapeutic potency but also exhibits the rejuvenation (rasāyana) properties.

The process 'jāraṇa' is also aimed at improving the appetite of mercury through various pharmaceutical procedures. By addition of 'viḍa' (find in Paribhāṣā Prakaraṇa), the hunger of the mercury increases to many folds. Only then, it becomes efficient enough to digest the metals like swarṇa, rajata, abhraka sattva etc.

With the help of 'viḍa' and through various pharmaceutical procedures carried out using variety of instruments like 'vālukā yantra', 'kacchapa yantra', 'jāraṇa yantra' etc, the process of digesting other metals and minerals in mercury is called as 'jāraṇa'.

Among 'aṣṭādaśa pārada saṁskāra', the 'grāsamāna', 'cāraṇa', 'garbha-dṛti' and 'bāhya-dṛti' are meant only for 'jāraṇa' of mercury, i.e. to imbibe extra appetite in mercury.

**Jāraṇa- definition:**

जारणा हि नाम गालनपातनव्यतिरेकेन ग्रस्तघनहेमादिरसस्य पूर्वावस्था प्रतिपन्नत्वम् ।

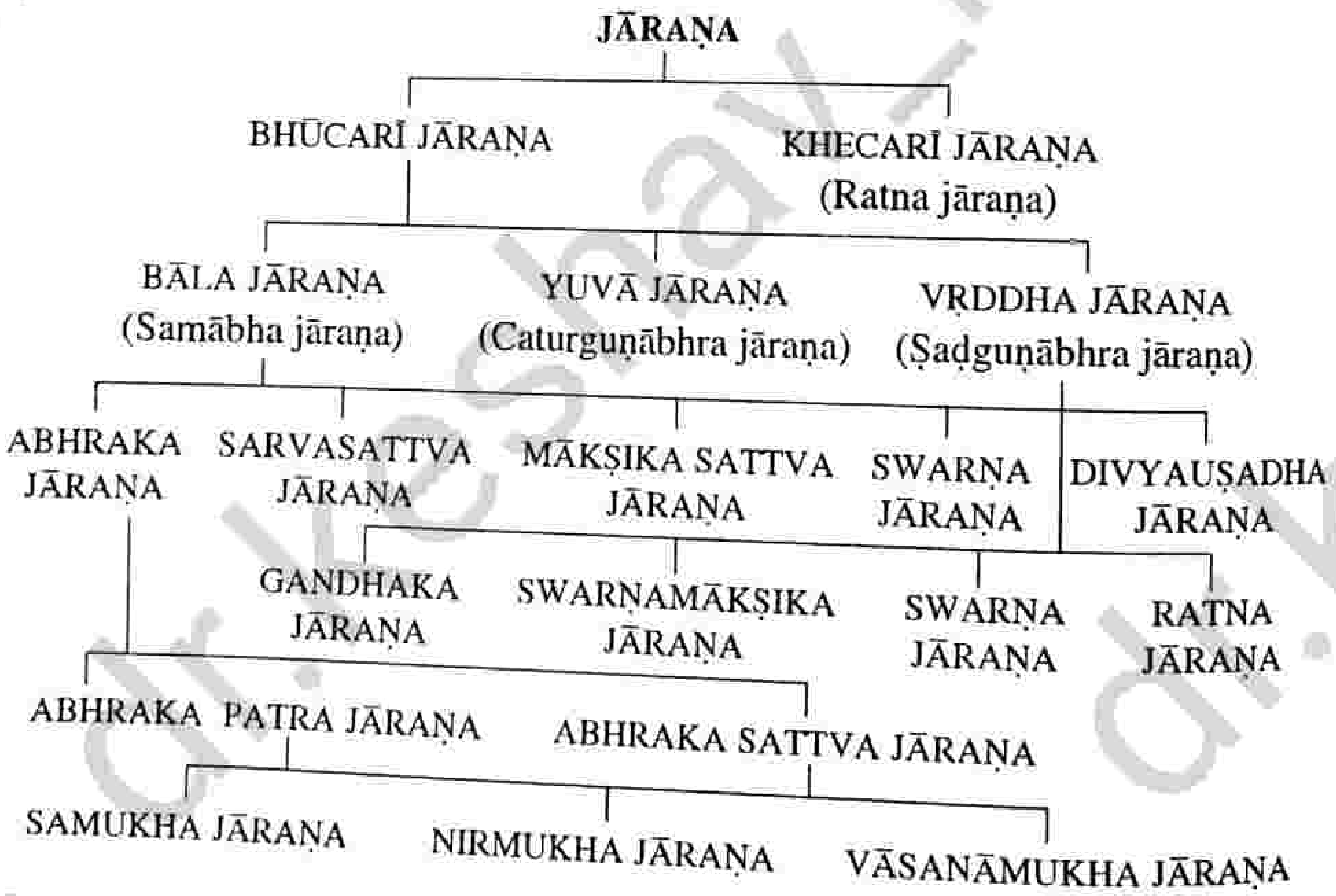
(Āy. Pra. 1/107)

Jāraṇa is the procedure where the mercury digests the selected metals and minerals (swarṇa, abhraka etc) in it without undergoing any of the special procedures like gālana (melting) and pātana (distillation); and more importantly remains in its earlier form with absolutely no change in its quantity, weight or consistency.

**JĀRAṆA BHEDA**

The categorization of 'jāraṇa' can be done in three ways as mentioned below. The details of the same is shown in the flow chart that follows;

| | | | |
|---|---|---|---|
| I) | 1. Bhūcarī jāraṇa | 2. Khecarī jāraṇa | |
| II) | 1. Bāla jāraṇa | 2. Yuvā jāraṇa | 3. Vṛddha jāraṇa |
| III) | 1. Samukha jāraṇa | 2. Nirmukha jāraṇa | 3. Vāsanāmukha jāraṇa |


JĀRAṆA
BHŪCARĪ JĀRAṆA
KHECARĪ JĀRAṆA (Ratna jāraṇa)
BĀLA JĀRAṆA (Samābha jāraṇa)
YUVĀ JĀRAṆA (Caturguṇābhra jāraṇa)
VṚDDHA JĀRAṆA (Ṣaḍguṇābhra jāraṇa)
ABHRAKA JĀRAṆA
SARVASATTVA JĀRAṆA
MĀKṢIKA SATTVA JĀRAṆA
SWARṆA JĀRAṆA
DIVYAUṢADHA JĀRAṆA
GANDHAKA JĀRAṆA
SWARṆAMĀKṢIKA JĀRAṆA
SWARṆA JĀRAṆA
RATNA JĀRAṆA
ABHRAKA PATRA JĀRAṆA
ABHRAKA SATTVA JĀRAṆA
SAMUKHA JĀRAṆA
NIRMUKHA JĀRAṆA
VĀSANĀMUKHA JĀRAṆA

Note: The above said categorization of 'jāraṇa' cannot be obtained in any single referral book. The flow chart reflects the opinion of many authors from different classical references.

Find the meanings of different terminologies used in the chart below;

- Bhūcarī jāraṇa: The different pharmaceutical procedures adopted for digesting selected metals and minerals in 'śuddha pārada' with the primary intention of gaining more therapeutic effectiveness is known as 'bhūcarī jāraṇa'.

- Khecarī jāraṇa: The process of digesting rare and expensive precious stones (ratna) in 'śuddha pārada' is known as 'khecarī jāraṇa'. The term 'khecarī' means the 'art of flying in the sky'. Here it is claimed that the 'khecarī jārita pārada' when administered, induces unbelievable powers that enable the person to fly high in the sky. These claims do not hold any significance in practical world.
- Bāla jāraṇa: The process of digesting one part of 'abhraka sattva' in one part of 'śuddha pārada' is known by the name 'bāla jāraṇa' (samābhra jāraṇa).
- Yuvā jāraṇa: The process of digesting four parts of 'abhraka sattva' in one part of 'śuddha pārada' is known by the name 'yuvā jāraṇa' (caturguṇābhra jāraṇa).
- Vṛddha jāraṇa: The process of digesting six parts of 'abhraka sattva' in one part of 'śuddha pārada' is known by the name 'vṛddha jāraṇa' (ṣaḍguṇābhra jāraṇa).
- Samukha jāraṇa: The process of digesting selected metals, minerals or precious stones only after creating the desired hunger (mukha) in 'śuddh pārada' is known as 'samukha jāraṇa'. The mukha or the hunger or the appetite in mercury can be created by triturating the mercury with 'viḍa' (find about 'viḍa' in Paribhāṣa Prakaraṇa).
- Nirmukha jāraṇa: The process of digesting selected metals, minerals or precious stones without creating the desired hunger (mukha) in 'śuddh pārada' is known as 'nirmukha jāraṇa'. In this jāraṇa only limited drugs can be digested in mercury.
- Vāsanāmukha jāraṇa: The process of digesting selected metals, minerals or precious stones after creating the hunger (mukha) in 'śuddh pārada' by processing it with selected 'aromatic drugs' is known as 'vāsanāmukha jāraṇa'.

**Jāraṇa krama (sequence for jāraṇa):**

> गन्धकं जारयेत्पूर्वं यन्त्रे कच्छपसञ्ज्ञके । पश्चाद्वै जारयेद्व्योम हेमप्रभृति यद्भवेत् ।।
> पश्चान्नागादयः सर्वे जार्यन्ते रत्नसङ्कराः । क्रमोऽयं विद्यते सर्वजारणासु न संशयः ।।
> विना गन्धेन ये मर्त्याः कुर्वन्ति धातुजारणाः ।
> न क्षुधा जायते सूते जरयन्ति न धातवः । तस्माद् गन्धं पुरा जार्यः सूतवह्निविवृद्धये ।।
>
> (R. Ci. 5/70-73)

- Another reference:

गगनं जारयेदादौ सर्वसत्त्वमतः परम्। ततो माक्षिकशुद्धं च सुवर्णं तदनन्तरम्।। (Rasārṇava 11/8)

The general sequence of digesting other metals and minerals in mercury is specified in the classics. At the beginning, 'jāraṇa' of 'śuddha gandhaka' is done with the help of 'kacchapa yantra', followed by jāraṇa of 'śuddha abhraka', 'śuddha swarṇa mākṣika sattva' or 'śuddha swarṇa'. Later the jāraṇa of 'śuddha nāga' and 'śuddha vaṅga' and the 'śuddha ratna' is done. This is the correct sequence of 'jāraṇa' that has to be followed.

Without the jāraṇa of 'śuddha gandhaka' at the beginning, the jāraṇa of other drugs should not be done, because, only after jāraṇa of gandhaka the mercury attains desired appetite to digest the other metals and minerals in it. Therefore, jāraṇa of gandhaka is the most significant aspect of jāraṇa process.

**Jāraṇa- general method:**

The jāraṇa process can be carried out in two ways;

1. Bahirdhūma vidhi:

The 'bahirdhūma vidhi' is the open method of 'jāraṇa'. Here the gandhaka or other metals and minerals are digested in 'śuddha pārada' in a selected crucible placed in 'vālukā yantra'. In this method, the process of 'jāraṇa' (especially gandhaka jāraṇa) will be completed within short time.

2. Antardhūma vidhi:

The 'antardhūma vidhi' is the closed method of 'jāraṇa'. Here the gandhaka or other metals and minerals are digested in 'śuddha pārada' by enclosing all the drugs in a 'kācakūpī', 'mūṣā' or any other suitable vessel. This digestion process will be usually carried out in 'kacchapa yantra' or in 'bhūdhara yantra'. In this method, the process of 'jāraṇa' (especially gandhaka jāraṇa) will be delayed in comparison with the earlier method.

**Ṣaḍguṇa gandhaka jāraṇa- 1st method:**

निधाय वालुकायन्त्रे चषकं सुदृढं भिषक् । रसतुल्यं बलिं तस्मिन्निक्षिपेत् खलु शोधितम् ।।
बलिं तु विद्रुतं दृष्ट्वा रसेशं तत्र दापयेत् । अर्द्धजीर्णं बलिं ज्ञात्वा पुनर्गन्धं प्रदापयेत् ।।
आषड्गुणंक्षिपेदेवमल्पमल्पं समाहितः । स्वतः शीतं ततो ज्ञात्वा रसेशं तु समाहरेत् ।।

(R. T. 5/102-104)

To digest 6 parts of śuddha gandhaka in śuddha pārada, place an earthen or iron bowl of suitable size on 'vālukā yantra'. In that bowl, one part of sulphur (equal to that of mercury) is put and the fire beneath the vālukā yantra is ignited. When all the sulphur melts, equal quantity of mercury is added to it and heated further.

When the liquefied sulphur is reduced to half the earlier quantity, one more part of sulphur is added and heated. Like this each time when the sulphur is reduced to half, the same quantity of sulphur is added and heated. This process is repeated for six times to imbibe 6 parts of purified sulphur in purified mercury.

At the end, when all the sulphur is reduced, the mercury is washed with warm water filtered through a cloth, collected and stored. This mercury possesses the desired therapeutic efficacy.

**Ṣaḍguṇa gandhaka jāraṇa- 2nd method:**

> कच्छपाख्येन यन्त्रेण रसतन्त्ररहस्यवित् । उक्तमार्गानुसारेण जारयेत् षड्गुणं बलिम् ॥
>
> (R. T. 5-105)

Experts in the field of 'Rasaśāstra' can digest 6 parts of purified gandhaka in purified mercury using 'kacchapa yantra' instead of 'vālukā yantra'. The procedure is similar with both the instruments.

**Gandhaka jārita pārada and its properties:**

- As per Rasa Taraṅgiṇī:

> समे तु गन्धके जीर्णे सामान्यगदनाशनः । द्विगुणे तु विशेषेण महारोगविधूननः ॥
> त्रिगुणे तु विशेषेणाक्षय्यपुंस्त्वप्रकाशनः । चतुर्गुणे महोत्साहमेधास्मृतिविवर्धनः ॥
> तथा पञ्चगुणेऽशेषगदसन्तापनाशनः । रसेश्वरः षड्गुणे तु विविधाद्भुतकार्यकृत् ॥
>
> (R. T. 5/106-108)

- As per Āyurveda Prakāśa:

> तुल्ये तु गन्धके जीर्णे शुद्धाच्छतगुणो रसः । द्विगुणे गन्धके जीर्णे सर्वथा सर्वकुष्ठहा ॥
> त्रिगुणे गन्धके जीर्णे सर्वजाड्य विनाशनः । चतुर्गुणे तथा जीर्णे वलीपलितनाशनः ॥
> गन्धे पञ्चगुणे जीर्णे क्षयक्षयकरो रसः । षड्गुणे गन्धके जीर्णे सर्वरोगहरो रसः ॥
>
> (Āy. Pra. 1/118-120)

The properties of purified mercury digested with different ratios of purified purified sulphur are provided in the table below;

| **Ratio of Pārada : Gandhaka** | **Therapeutic effectiveness** | |
|---|---|---|
| | **Rasa Taraṅgiṇī** (5/106-108) | **Āyurveda Prakāśa** (1/118-120) |
| **1 : 1** (Ekaguṇa balijārita pārada) | सामान्यगदनाशनः<br>Cures only the common ailments | शुद्धाच्छतगुणो रसः<br>100 times more potent than 'śuddha pārada' |

| Ratio of Pārada : Gandhaka | Therapeutic effectiveness | |
|---|---|---|
| | **Rasa Taraṅgiṇī** (5/106-108) | **Āyurveda Prakāśa** (1/118-120) |
| **1 : 2** (Dwiguṇa balijārita pārada) | महारोगविधूननः<br>Cures mahāroga (deeper aliments) | सर्वकुष्ठहा<br>Cures all types of kuṣṭha roga |
| **1 : 3** (Triguṇa balijārita pārada) | पुण्स्त्वप्रकाशनः<br>Induces 'virility' | सर्वजाड्यविनाशनः<br>Cures śarīra jaḍatā |
| **1 : 4** (Caturguṇa balijārita pārada) | महोत्साहमेधास्मृतिविवर्धनः<br>Improves 'utsāha' (enthusiasm), medhā (intellect) and smṛti (memory power) | वलीपलितनाशनः<br>Cures valī (wrinkles in the skin) and palita (greying of hair) |
| **1 : 5** (Pañcaguṇa balijārita pārada) | शेषगदसन्तापनाशनः<br>Cures all types of chronic ailments | क्षयक्षयकरो रसः<br>Cures 'kṣaya roga' |
| **1 : 6** (Ṣaḍguṇa balijārita pārada) | विविधाद्भुतकार्यकृत्<br>Brings extraordinary powers | सर्वरोगहरो रसः<br>Cures all types of diseases |

*

## Chapter 13

# MŪRCCHANĀ

### Mūrcchanā- definition:

तत्तद्विधिप्रभेदेन रसस्याव्यभिचारत: । व्याधिघातकता या स्यात् सा मता मूर्च्छना बुधैः ।।

(R. T. 6/1)

The act of imbibing definite therapeutic properties (vyādhināśaka śakti) in purified mercury used in any of the compound formulation (with or without sulphur), through various pharmaceutical procedures is known as mūrcchanā.

Note: 'Mūrcchanā' explained here is different from the 'mūrcchana saṁskāra' explained in 'aṣṭa-saṁskāras' of mercury. The brief difference between both is provided in the table below;

| Mūrcchanā | Mūrcchana saṁskāra |
|---|---|
| 1. It is the act of imbibing definite therapeutic efficiency (vyādhighātaka śakti) in mercury. | 1. It is the 3rd saṁskāra among the 'aṣṭa -saṁskāras' of mercury. It is done to alleviate the 'naisargika doṣas' of mercury. |
| 2. Here mercury is rendered fit for consumption through various pharmaceutical procedures. | 3. Here mercury is converted from its natural form (cañcalatwa and durgrāhyatwa) to 'piṣṭa' or 'kalka' form (acañcala and sugrāhya). |
| 4. Here the mercury emerges in the form of khalvīya, parpaṭī, poṭṭalī and kūpīpakwa rasāyanouṣadha. | 2. Here the nāga, vaṅga and other natural doṣas present in the mercury are alleviated. |

### Mūrcchanā types:

निर्गन्धा च सगन्धा च मूर्च्छना द्विविधा मता । निर्गन्धा गन्धरहिता सगन्धा गन्धसंयुता ।।

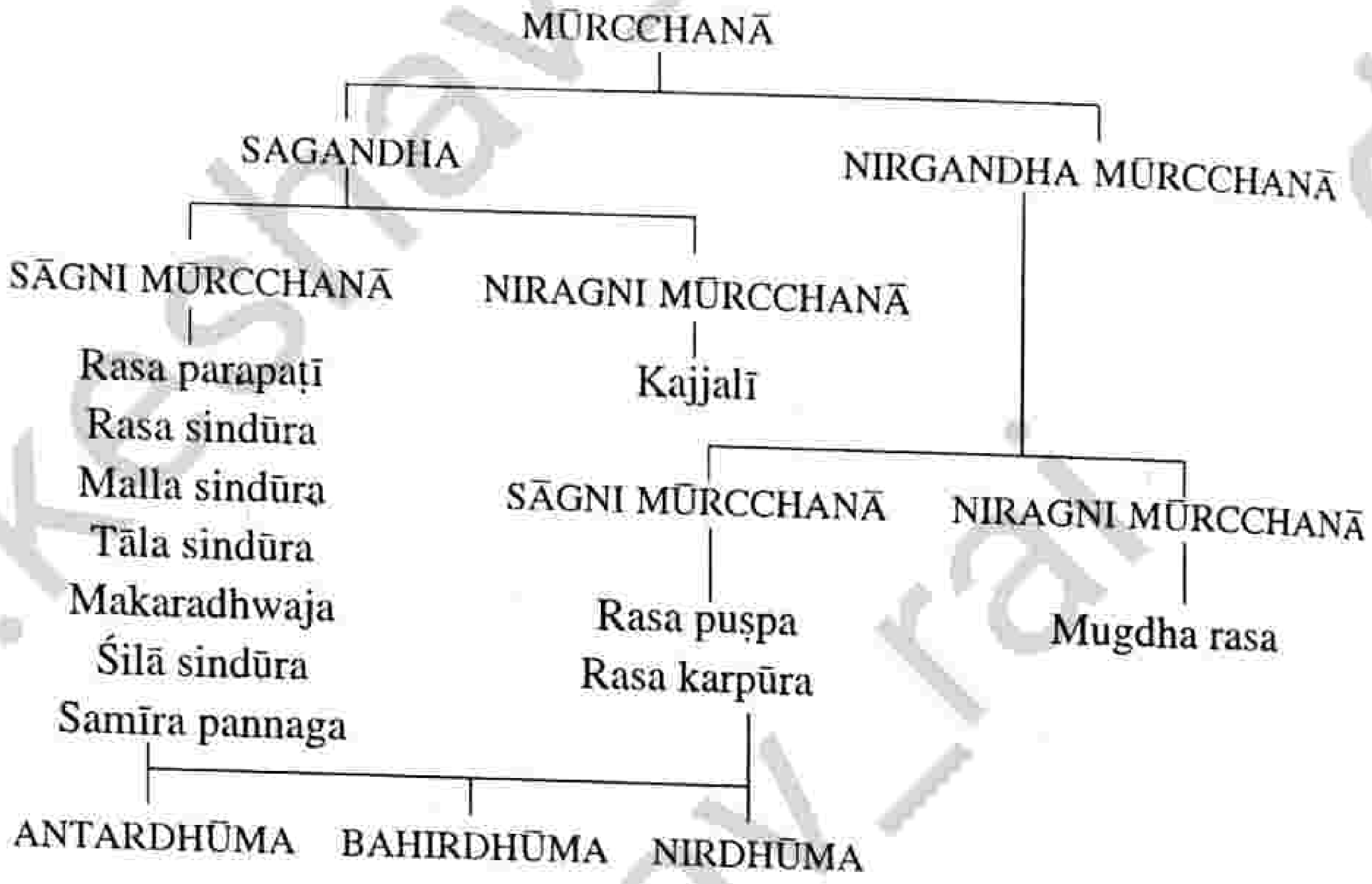
(R. T. 6/2)

Mūrcchanā is basically categorized as 'nirgandha mūrcchanā' and 'sagandha mūrcchanā'. Nirgandha mūrcchanā is the mūrcchanā of pārada without gandhaka and the 'sagandha mūrcchanā' is the pārada mūrcchanā along with gandhaka.

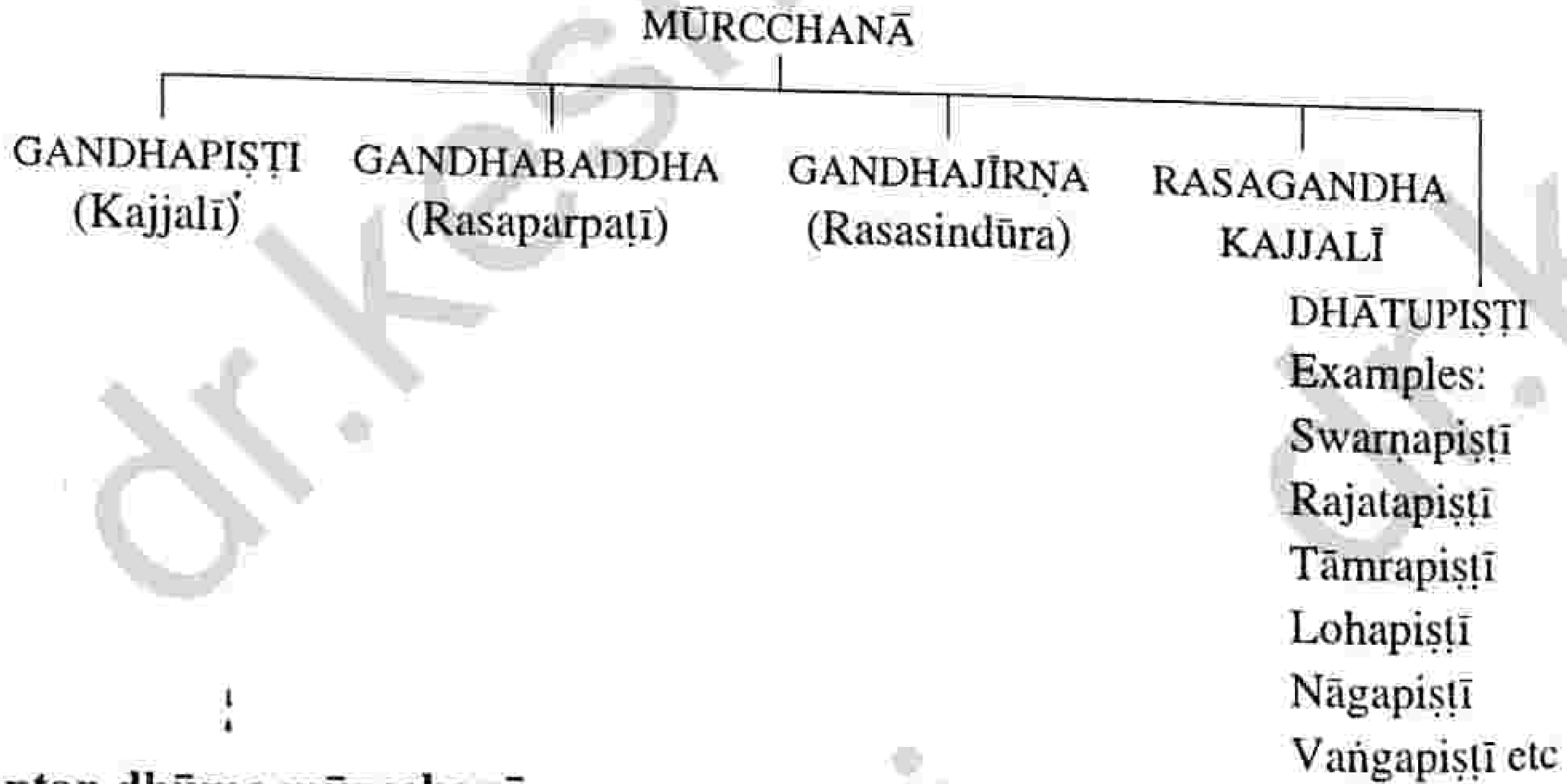
Depending on the method of preparation, these 'mūrcchanā' procedures can be further classified as 'sāgni' (with the help of fire) and 'niragni' (without the help of fire) mūrcchanā.

This 'sāgni mūrcchanā' can be further classified as 'antardhūma', 'bahirdhūma' and 'nirdhūma' depending on the method adopted. The flow charts below exhibit the vivid classification of 'mūrcchanā'.

**I) First categorization flow chart of mūrcchanā:**


MŪRCCHANĀ
SAGANDHA
NIRGANDHA MŪRCCHANĀ
SĀGNI MŪRCCHANĀ
NIRAGNI MŪRCCHANĀ
Rasa parapaṭī
Rasa sindūra
Malla sindūra
Tāla sindūra
Makaradhwaja
Śilā sindūra
Samīra pannaga
Kajjalī
SĀGNI MŪRCCHANĀ
NIRAGNI MŪRCCHANĀ
Rasa puṣpa
Rasa karpūra
Mugdha rasa
ANTARDHŪMA
BAHIRDHŪMA
NIRDHŪMA

**II) Second categorization chart of mūrcchanā:**


MŪRCCHANĀ
GANDHAPIṢṬI (Kajjalī)
GANDHABADDHA (Rasaparpaṭī)
GANDHAJĪRṆA (Rasasindūra)
RASAGANDHA KAJJALĪ
DHĀTUPIṢṬI
Examples:
Swarṇapiṣṭī
Rajatapiṣṭī
Tāmrapiṣṭī
Lohapiṣṭī
Nāgapiṣṭī
Vaṅgapiṣṭī etc

**Antar-dhūma mūrcchanā:**

In '**antar-dhūma mūrcchanā**', the suitable medicinal drugs are taken in an 'mṛtkapaṭita kācakūpī' (beer bottle systematically covered with 7 layers of mud smeared cloth) and the mouth of the bottle is sealed at the beginning of the heating process. The bottle is placed firmly in 'vālukā yantra' and subjected for desired amount of heat for stipulated time period. This facilitates suitable compound formation in the bottle. This method is called as antar-dhūma vidhi mūrcchanā.

Examples: Rasasindūra can also be prepared with this 'antar-dhūma mūrcchanā' method.

Note:

- When 'sagandha mūrcchanā' done with 'antar-dhūma method', the temperature should be maintained below the boiling point of sulphur (444.8° C) as there is no chance for the fumes of sulphur to move out.
- Since heat intensity is low here, the temperature needs to be applied for a longer duration to facilitate suitable compound formation.

### Bahir-dhūma mūrcchana:

In **'bahir-dhūma mūrcchana'**, the medicinal drugs are taken in an open 'mṛtkapaṭita kācakūpī', the bottle is placed firmly in 'vālukā yantra' and subjected for desired amount of heat. When all the sulphur fumes escape, the mouth of the bottle is sealed and the process of heating is continued further until the suitable compound is formed in the bottle. This method is called as bahir-dhūma vidhi mūrcchanā.

Examples: Rasa sindūra, Rasa karpūra, Makaradhwaja etc.

Note:

- When 'sagandha mūrcchanā' done with 'bahir-dhūma method', the temperature of high intensity may be applied to facilitate proper compound formation.
- The time of compound formation is shorter here as the heat intensity is more than the boiling point of sulphur.

### Sagandha and nirgandha mūrcchita pārada yoga:

> सगन्धमूर्च्छितः सूतः सुचिरं परिशालितः । न जातु प्रकरोतीह विकारान् पारदोत्थितान् ।।
> निर्गन्धमूर्च्छितः सूतो गदसंक्षयकालतः । अनन्तरं शीलनेन विकारान् जनयेद् भृशम् ।।
> (R. T. 6/7-8)

Any **'sagandha mūrcchita pārada yoga'** may be administered for longer duration even after the disease symptoms subside. By doing so, one can anticipate desired 'rasāyana effect' out of the medicine. In such prolonged administrations also, the medicine does not exhibit any toxic effects (of mercury) in the body.

On the other hand, '**nirgandha mūrcchita pārada yoga**' if administered for longer duration, the chances of toxic effects (of mercury) cannot be ruled out. Here the 'rasāyana effect' cannot be anticipated out of prolonged administration.

Inference: Though both 'sagandha mūrcchita pārada yoga' and 'nirgandha mūrcchita pārada yoga' are equally effective from therapeutic point of view, first group of medicines are safer in comparison with the latter ones.

Note: The same points may be legibly made out in the below table;

| Sagandha mūrcchita pārada yoga | Nirgandha mūrcchita pārada yoga |
|---|---|
| 1. Can be administered for longer duration even after the disease symptoms subside. | 1. Cannot be administered for longer duration after the disease symptoms subside. |
| 2. By prolonged administration, desired 'rasāyana effect' may be anticipated from the medicine. | 2. Here by prolonged administration, 'rasāyana effect' cannot be anticipated. |
| 3. Even with prolonged administrations, the medicine does not exhibit any toxic effects (of mercury) in the body. | 3. With prolonged administration, the chances of severe toxic effects (of mercury) cannot be ruled out. |

- **Mūrcchanā and Jāraṇa- difference:**

The difference between 'mūrcchanā' and 'jāraṇa' is rarely explained by any of the classical books. Instead, some books use these two terminologies as synonymous words.

किं च मूर्च्छना जारणा इत्यनर्थान्तरं प्रायः ।

However, practically the 'mūrcchanā' and 'jāraṇa' are two different pharmaceutical procedures carried out on mercury with different intentions. After thorough consideration of their meanings, the following differential points may be drawn.

| Mūrcchnā | Jāraṇa |
|---|---|
| 1. It is the act of imbibing definite therapeutic efficiency (vyādhināśaka śakti) in mercury. | 1. It is the act of creating 'mukha' (hunger) in mercury through addition of 'viḍa'. |
| 2. Mūrcchnā is useful in 'dehavāda' as 'mūrcchita pārada' comes in the form of different compound formulations. | 2. Jāraṇa is not directly useful in 'dehavāda' but is more useful in 'dhātuvāda'. |

| Mūrcchnā | Jāraṇa |
|---|---|
| 1. Here mercury is rendered fit for consumption through various pharmaceutical procedures. | 1. Here 'mukha' is created to digest other metals and minerals in mercury to strengthen it further. |
| 2. Here the mercury emerges in the form of khalvīya, parpaṭī, poṭṭalī and kūpīpakwa rasāyanouṣadha. | 2. Jārita pārada is potent but cannot be consumed until it undergoes 'mūrcchanā' and emerge as a compound formulation. |

## KAJJALĪ

### Kajjalī- definition:

धातुभिर्गन्धकाद्यैश्च निर्द्रवैर्मर्दितो रसः । सुश्लक्ष्णः कज्जलाभोऽसौ कज्जलीत्यभिधीयते ॥

(R. R. S. 8/5)

- Another reference:

निर्द्रवैर्धातुभिश्चाथ गन्धादिभिः पेषितः पारदः श्लक्ष्णतां प्रापितः ।
कज्जलाभो यदा जायतेऽसौ तदा नामतः कोविदैः कज्जलीत्युच्यते ॥ (R. T. 2/27)

Śuddha 'pārada' is taken in a clean khalva yantra along with desired ratio of 'śuddha gandhaka' or any purified rasa dravya or dhātu bhasma and triturated thoroughly 'without adding any liquids' (water, swarasa, kwātha etc) to obtain the mixture in jet-black coloured fine powder form. This black coloured powder with no shiny particles in it is called as 'kajjalī'.

### Kajjalī- test of perfectness:

The prepared kajjalī should be a smooth and soft powder with no shiny particles of mercury in free metal form. To test that, a pinch of kajjalī is taken on the left palm; a drop of water is put on it and rubbed with right index finger. If shiny particles of free mercury are seen either on the palm or on the finger, one should consider it as an imperfect kajjalī and subject it for further trituration.

## CLASSIFICATION OF RASAUṢADHIS

The medicines prepared form 'mūrcchita pārada' are classified as below;

**Mūrcchita Pārada Auṣadha**

| KHARALĪYA RASĀYANA | PARAPAṬĪ RASĀYANA | POṬṬALĪ RASĀYANA | KŪPĪPAKWA RASĀYANA |
|---|---|---|---|
| Kajjalī | Rasa parapaṭī | Rasagarbha poṭṭalī | Rasa sindūra |
| Tribhuvanakīrti rasa | Gagana parapaṭī | Hemagarbha poṭṭalī | Rasa karpūra |
| Ārogyavardhinī vaṭī | Swarṇa parapaṭī | etc | Makaradhwaja |
| Agnituṇḍī vaṭī etc | Śweta parapaṭī etc | | etc |

Note: Find below the detailed explanation of 'khalvīya rasāyana', 'parpaṭī rasāyana', 'poṭṭalī rasāyana' and 'kūpīpakwa rasāyana' below and their examples in the 'Auṣadha Yoga' chapter of this book.

## (I) KHARALĪYA RASĀYANA

The kharalīya or khalvīya rasāyana stands foremost in comparison with other three parpaṭī, poṭṭalī and kūpīpakwa rasāyana in terms of its popularity, wide range of therapeutic utility and ease of preparation.

Parpaṭī, poṭṭalī and kūpīpakwa rasāyana are limited in numbers but the khalvīya rasāyana are innumerable and most suitably indicated in vast majority of disease conditions.

Since these formulations are completely prepared and obtained as end products in khalva yantra by the act of trituration, they are called as kharalīya or khalvīya rasāyana.

Whenever a formulation is prepared in khalva yantra it needs rigorous trituration. The term trituration is originated from the root Latin word *'trituratio'* which means to rub. Trituration may be defined as the act of reducing a drug to a finer state of subdivision in a mortar and pestle manually or with a mechanical device.

The act of triturating a drug with any liquid not only reduces the drug particles to a finer state of subdivision but also facilitates the breakage and reunion of bonds in the material triturated. As a result of which we find an entirely different compound formation by the end of total trituration.

On a broader sense some of the key factors which directly influence the formation of new compound in case of khalvīya rasāyana are;

1. Nature of the drug material
2. Mass and size of drug particles
3. Amount of liquid added
4. Pressure applied during trituration
5. Rhythm maintained for the trituration,
6. Time duration of trituration
7. Trituration surface area
8. Humidity
9. Room temperature etc

**General preparation method of kharalīya rasāyana kalpanā:**

- Kharalīya or khalvīya rasāyana essentially contain, śuddha pārada, hiṅgula or rasasindūra; śuddha gandhaka; any drugs from mahārasa, uparasa, sādhāraṇa rasa groups; dhātu bhasma; ratnoparatna bhasma/piṣṭi; sudhā/sikatā varga dravya etc.
- These formulations require any of the liquid preparations (swarasa, kwātha, hima, phāṇṭa etc) of many herbal drugs (kāṣṭhauṣadhi) or any of the natural liquids like, jala, godugdha, gomūtra, ajadugdha etc for the purpose of bhāvanā.
- The kajjalī or the fine powders of other purified rasa dravya are taken into a khalva yantra and mixed properly to obtain a homogenous mixture. Later this mixture is subjected for trituration with any of the liquids mentioned above in khalva yantra.
- These formulations are completely prepared in khalva yantra. After specific bhāvanā/mardana in khalva yantra, we directly obtain the end product which needs to be collected, dried and stored in airtight containers for further therapeutic use.
- Since the end product is completely done and obtained only in khalva yantra, these preparations are called as kharalīya or khalvīya rasāyana.
- If the stored end product is marketed, it has to be neatly labeled with all the details about the preparation as regulated by Good manufacturing Practice (GMP); which should contain;
    - Name of the preparation in big capital letters
    - Reference
    - Indication
    - Contents (separate literature is placed if more ingredients)
    - Dose
    - Adjuvant
    - Batch number
    - Registration number
    - Name of the manufacturer and address
    - Date of manufacture
    - Date of expiry
    - Prize of the product
    - Advise to keep the drug in a cool and dry place
    - Toll free customer care number and
    - Email address

**Rationality behind selection of liquids for bhāvanā:**

All the classical preparations formulated by ancient seers of Āyurveda are time tested and reliable formulations. These readymade formulations have made our treatment process lot more easier and effective. Any kharalīya rasāyana kalpa usually comes with one or more bhāvanā dravya. What may be the criteria behind selection of specific bhāvanā dravya for a particular formulation!? This query pops up in any every one's mind. The similar question may arise when we think, how any compound formulation is formulated? On what basis the specific drugs are combined together to form a compound formulation?

When we ponder for answers to above posed questions, we wonder at sheer intelligence of the ancient seers; they very meticulously thought on the properties of each drug and the disease condition in which it has to be administered and later came up with a specific bhāvanā dravya or a set of bhāvanā dravya for a particular preparation. On the same grounds they formulated a compound formulation after so many trial and error combination methods.

Now it is our duty to think and find out the scientific rationality behind framing of a formulation or selection of a bhāvanā dravya. Some of the hypothetical points to justify the above said theory are as below;

**1. Synergism:** When two or more drugs of similar properties are combined together and processed, they augment the activity of one another to produce an effect which would not have been possible for any of the involved drugs individually. In this context whenever any bhāvanā dravya or set of bhāvanā dravyas are selected for a particular formulation this concept is kept in mind.

Example:

- In case of 'Gandhaka rasāyana' preparation, the 11 bhāvanā dravya augment the only ingredient that is śuddha gandhaka to make it effective in wide range of disuse conditions.
- In 'Agnikumāra rasa' preparation, to the set of 7 herbo-mineral drugs, the bhāvanā dravya used is jambīra nimbū swarasa, which itself is an excellent appetizer by virtue of its tīkṣṇa guṇa, amla rasa and amla vipāka.
- In 'Ekāṇgavīra rasa', the 9 bhāvanā dravya prominently contribute to the efficacy of the formulation by virtue of their strong vātaśāmaka guṇa.
- In 'Prabhākara rasa', which is indicated in all kinds of hṛdroga, the bhāvanā dravya used is arjuna swarasa. Arjuna by virtue of its kaṣāya rasa, laghu-

rūkṣa guṇa, śīta vīrya and prabhāva as hṛdya, greatly assist and support the therapeutic action of the formulation.

**2. Antagonism:** When two or more drugs of opposite properties are combined together and processed, they bring down the ill effects of one another; in other words they help to harmonizing the gurvādi guṇa of one another. At many instances, the tīkṣṇtā of the drugs will be greatly reduced.

Example:

- In case of 'Marīca śodhana' the bhāvanā dravya used is amla takra; here the laghu-tīkṣṇa guṇa, kaṭu rasa, kaṭu vipāka and uṣṇa vīrya of marīca is counter-acted by the exactly opposite properties of amla takra which possesses amla-madhura rasa and śīta vīrya.

**3.** Bhāvanā dravya contributes in getting rid of the any disagreeable taste and unpleasant odor of the end product.

Examples:

- In case of 'Vasantamālatī rasa', to the set of five herbo-mineral drugs the bhāvanā dravya used are 'drākṣā kwātha' which helps to bring in palatability and 'nimbū swarasa' which adds pleasant flavour to the end product.
- In case of 'Rāmabāṇa rasa', to the set of six herbo-mineral drugs the bhāvanā dravya used is 'ciñcāphala rasa' which removes the un-palatability by making it palatable.
- In case of 'Kaphaketu rasa', to the set of five herbo-mineral drugs the bhāvanā dravya used is 'ārdraka swarasa' which adds good palatability and odor.

**4.** Bhāvanā dravya contributes in adding the pleasant colour and appearance to the end product.

Example:

- In case of 'Aśvakañcukī rasa', to the set of eight herbo-mineral drugs the bhāvanā dravya used is 'bhṛṅgarāja swarasa' which not only adds to the therapeutic properties but also imparts the pleasant pale red color to the end product.

**5.** The bhāvanā dravya adds and augments not only the therapeutic qualities of the drugs but also add to the bulkiness of the end product.

Example:

- In case of 'Gandhaka rasāyana' the 11 bhāvanā dravya not only add and augment the śuddha gandhaka to make it effective in its therapeutic utility but also considerably increase the bulkiness of the śuddha gandhaka after all the bhāvanās.

**6.** The bhāvanā dravya alleviates the toxic properties in a 'viṣa dravya'.

Example:

- The poisonous drug 'Ahiphena' (Papaver somniferum) is purified by 21 times bhāvanā of 'śuṇṭhī swarasa'.

Note: Kindly find the examples of **'Khalvīya rasāyana'** and their explanation in the 25th chapter named 'Aūṣadha Yoga'.

## (II) PARPAṬĪ RASĀYANA

**General introduction:**

The term 'parpaṭī' emanates from the root word 'parpaṭa' which means 'pāpaḍ' or a thin wafer. The terms parpaṭa, parpaṭī, parpaṭikā are synonymous words in classics.

These parpaṭī formulations have always held a unique place as 'rasauṣadhi'. Parpaṭī kalpanā is known for its distinct and uniform method of preparation followed by all the authors. These formulations are named so on the shape and appearance in which we obtain the end product (parpaṭākṛtī = pāpaḍ shape).

Most of these formulations are specifically indicated in 'grahaṇī roga'. In fact, the first reference of parpaṭī (rasa parpaṭī) is mentioned in 'grahaṇī cikitsā', which is found in 'Cakradatta' a book written by Ācārya Cakrapāṇidatta in 11th century.

Later to Cakradatta, many books such as 'Vaṅgasena', 'Rasaratnasamuccaya', and 'Rasendrasārasaṅgraha' significantly mention about parpaṭī kalpanā. This trend is followed by all most all the rasa books of later centuries.

The reference of parpaṭī is also traced from a book named 'Rasendramaṅgala' believed to be written by Ācārya 'Nāgārjuna' of 8th century. However, the author of this book is the same 'Nāgārjuna' of 8th century or not is uncertain. If this is supposed to be true, then the first reference for parpaṭī kalpanā may be traced from as early as 8th century.

**Definition:**

द्रुतकज्जलिका मोचापत्रके चिपिटीकृता च । स पोटः पर्पटी सैव बालाद्यखिलरोगनुत् ॥

(R. R. S. 11/72)

Liquefied kajjalī is poured over neatly arranged moca patra (śālmalī patra) (or any other suitable leaf) to obtain it in the form of thin wafer (papaḍ), it is also called as poṭa bandha of pārada and the same is called as parpaṭī

सैव पर्पटी पोटबन्धस्यैव पर्पटीति नामान्तरम् । (R. R. S. 11/72 commentary)

This is useful in all the disease conditions of childhood, adult age and old age

बालाद्यखिलरोगनुद् बालतरुणादिसमस्तव्याधिहृत् । (R. R. S. 11/72 commentary)

**Types of parpaṭī:**

Though the method of preparation is same in all the parpaṭī preparations, there are many number of parpaṭī preparations mentioned by different authors depending on 'dravya bheda' (difference in the contents).

On a broader sense these parpaṭī preparations may be classified as 'sagandha' (with śuddha gandhaka) parpaṭī and 'nirgandha' (without śuddha gandhaka) parpaṭī.

| Sagandha parpaṭī | Nirgandha parpaṭī |
|---|---|
| 1. The parpaṭī preparations, which contain śuddha gandhaka along with śuddha pārada as the main ingredients. | 1. The parpaṭī preparations, which do not contain śuddha gandhaka or śuddha pārada as main ingredients. |
| 2. Kajjalī (poṭa bandha of pārada) needs to be prepared here by triturating the ingredients for 2 to 3 days. | 2. No kajjalī preparation is essential as these preparations lack gandhaka. |
| 3. These parpaṭī may contain different dhātu bhasma and śodhita rasadravya along with śuddha pārada and śuddha gandhaka. | 3. These generally do not contain metallic bhasma as they lack pārada. |
| 4. Dhātu bhasma and śodhita rasadravya will be digested into śuddha pārada and later śuddha gandhaka is added to prepare kajjalī. | 4. No digestion of dhātu or rasadravya as they usually do not contain pārada. |
| 5. Majority of the parpaṭī preparations explained in classics are sagandha parpaṭī. | 5. Very limited number of parpaṭī preparations we find as examples in nirgandha parpaṭī category. |
| 6. Examples: Rasa parpaṭī, Louha parpaṭī, Swarṇa parpaṭī, Tāmra parpaṭī, Vijaya parpaṭī, Pañcāmṛta parpaṭī, Gagana parpaṭī, Bola parpaṭī etc. | 6. Examples: Śweta parpaṭī, Malla parpaṭī etc. |

## The requirements for classical parpaṭī preparation:

**1. Khalva yantra (Mortar and pestle made of stone or iron):**

- A khalva yantra of appropriate shape, size and depth, made of either stone or iron is selected for trituration of the drugs mentioned, in particular to prepare kajjalī out of śuddha pārada and śuddha gandhaka.

**2. Loha darvī (Iron spoon):**

- An iron or copper darvī of the size of a bigger tablespoon with enough depth to hold the drug at its bottom and with long handle is selected for liquefying the drug material in it.
- Ample number of references may be traced from different classical parpaṭī preparations that specify the use of loha darvī. Some of them are as given below;

लोहपात्रेऽथवा ताम्रे । (Rasaparpaṭī; R. Yo. Sā. II part; preparation no 77)
पाचयेल्लोहपात्रस्थं । (Rasaparpaṭī; R. Yo. Sā. II part; preparation no 73)
ल्लोहपात्रजठरे प्रपाचयेत् । (Rasaparpaṭī; R. Yo. Sā. II part; prep no 74)

**3. Tea spoon:**

- A teaspoon of stainless steel may be used here for stirring kajjalī in the loha darvī while melting it. A metallic spatula may also serve the purpose.

**4. Heat source:**

- Any source of heat used for cooking may be used here. Glowing charcoal of any wood is used conventionally as heat source. Now-a-days LPG gas stoves are used everywhere for the purpose.
- The amount of heat applied during the preparation leads us to mṛdu, madhyama and khara pāka of parpaṭī. Mild fire (mṛdu agni) of around 115° C to 120° C is the temperature required here for melting the kajjalī (melting point of sulphur is 119° C).

मृद्वग्निना द्रुते तस्मिन् । (Rasaparpaṭī; R. Yo. Sā. II part; preparation no 77)

- In many of the classical references, we find 'badara' and 'khadira' wood used in particularly as heat source. The heat produced by these woods is stable. These do not burn out rapidly producing high flame at once. The charcoal of these woods is known to give stable heat for long time, which is very essential here.
- Because of all these advantages 'badara' or 'khadira' are asked to be used as heat source in these preparations. Instead, attributing any special qualities to

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the heat produced by badara or khadira wood may not be a clever approach. We find several references which specify badara or khadira wood as heat source;

घृतप्रलिप्तदर्व्यान्तु स्वेदयेन्मृदुनाऽग्निना ।। (Louha parpaṭī, B. R. 8/445)
दर्व्या बदरवन्हिनाऽतिमृदुना पाकं । Pañcāmṛtaparpaṭī; B. R. 8/458)
लोहपात्रे खादिराऽग्नौ मृदुपाको । (Pañcāmṛtaparpaṭ.; R. Yo. Sā. II part; prep no 48)
निर्धूमे बदराङ्गारे द्रवीकुर्यात्प्रयत्नत: ।। (Rasaparpaṭī; R. Yo. Sā. II part; prep no 71)

- When kajjalī starts to melt and attains oily or paste (paṅkavat) like form, then soon it has to be poured on to ghṛtalipta kadalī patra.

निर्धूमबदरकाष्ठाङ्गारे न्यस्तं विलाप्य तैलसमम् ।
(Rasaparpaṭī; ṭīkā; R. Yo. Sā. II part; prep no 71)
सूतं पङ्कसमं विलाप्य रुचिरं पाकक्रिया कोविद: । (Rasaparpaṭī; R. T. 6/136)

### 5. Gomaya (cow dung):

Gomaya used in the process of parpaṭī preparation should be wet and stable. It is not expected to be too thin. In some of the preparations, mahiṣa mala (buffalo's dung) is also used. In absence of both smooth, stone less wet mud may also be used for the purpose.

समविनिहितपङ्कस्थायिरम्भादलस्थं । (Pañcāmṛtaparpaṭī; R. Yo. Sā. II part/50)

However, cow dung, which is used extensively in these preparations, is advantageous in many ways;

- Because of its adhesiveness gomaya firmly holds the kadalī patra on it.
- Since it does not contain any hard part, along with kadalī patra it serves as a smooth base for poring liquefied kajjalī.
- Since it is cooler than room temperature, it helps in quick solidification of liquefied kajjalī poured over the kadalī patra.
- Gomaya, which is the output of alimentary tract, is believed to have some digestive enzymes and other additional secretions (gopitta) which traverse through the kadalī patra and will have a good influence on the medicine prepared over it.

सद्यो गोमयनिहिते कदलिदले ढालयेन्मृदुनि ।
(Rasaparpaṭī; ṭīkā; R. Yo. Sā. II part; prep no 71)
महिषीमलविन्यस्ते तत्र तत् कदलीदले । (Rasaparpaṭī; R. Yo. Sā. II part; prep no 71)

### 6. Kadalī patra (banana leaf):

- Kadalī patra is used here to prevent direct contact of the drug material with wet cow dung. Any wider, smooth, non-poisonous patra may be used here for the purpose.

- The leaves employed for this purpose in classical references are; kadalī patra, kamala patra, nāgavallī patra, arka patra, māca patra (śālmalī), kuṭaja patra, palāśa patra, eraṇḍa patra etc;

> रम्भाया लघु ढालयेत् पटुरियं पञ्चामृता पर्पटी । (Pañcāmṛta parpaṭī; B. R. 8/458)
> 
> तत्क्षिपेत्कदलीपत्रे गोमयस्योपरि स्थिते । (Rasa parpaṭī; R. Yo. Sā. II part; prep no 73)
> 
> प्रथमं कदली श्रेष्ठा ह्यलाभे पद्मिनीदलम् । तद्लाभे नागवल्ली …………… ।।
> 
> (Tāmra parpaṭī; R. Yo. Sā. I part; prep no 14)
> 
> ढालयेदर्कपत्रस्थां पर्पटीं रससिद्धये ।। (Tāmra parpaṭī; R. Yo. Sā. I part; prep no 15)
> 
> द्रुतकज्जलिका मोचापत्रे चिपटीकृता च । (Rasa parpaṭī; R. R. S. 11/72)
> 
> द्रुतमखिलमदस्तन्माचिकापत्रखण्डे ।। (Pañcāmṛta parpaṭī; R. Yo. Sā. II part; prep no 44)
> 
> काष्ठेनालो तत्सर्वं क्षिपेत्कुटजपत्रके । (Sudhāsāra rasa; R. Yo. Sā. II part; prep no 420)
> 
> कदलीपलाशैराच्छादयेद्वै । (R. T. 6/137)
> 
> कर्षमानेन सम्पिष्य पञ्चाङ्गुलदलेक्षिपेत् ।
> 
> (Kravyāda rasa parpaṭī; R. Yo. Sā. I part; prep no 353)

**7. Sneha:**

- Goghṛta (Cow's ghee) is used in the procedure to smear it in loha darvī and on kadalī patra in order to prevent adherence of drug material. Around 20 gms of sneha may be sufficient for each time.
- Moreover, the therapeutic properties of sneha may not be ignored, as it is good at pacifying vitiated vāta and pitta doṣas.

> घृताक्ते लोहपात्रेऽग्नौ द्रुतत्वादेकतां गतम् । (Abhra parpaṭī; R. Yo. Sā. I part; prep no 141)
> 
> अपि घृतपरिलिप्ते लोहपात्रे विपाच्य । (Pañcāmṛta parpaṭī; R. Yo. Sā. II part; prep no 44)

**General method of parpaṭī preparation:**

Śuddha pārada, any of the mentioned dhātu bhasma, śodhita rasadravya and śuddha gandhaka, are to be taken in a clean khalva yantra and triturated for minimum of 2 to 3 days to obtain appropriate kajjalī.

Meanwhile the banana leaf's mid rib has to be removed and it has to be cut into pieces of roughly around one square feet size. These pieces are applied with little amount of ghee and held for few seconds over fire. By doing this the leaf becomes tensile and do not tear off that easily during the process.

At the same time, the 2 to 3 kgs of cow dung has to be placed on a plane surface of one square feet near the oven with even upper part. Over this, one piece of kadalī leaf has to be firmly spread. Over the upper surface of the leaf little more ghee has to be smeared.

The remaining cow dung has to be taken in a wider piece of banana leaf and a firm poṭṭalī has to be tied. The base of the poṭṭal: is smeared with little ghee and kept ready.

Now around 20 to 25 gms of kajjalī at once is taken in a ghee smeared stainless steel tablespoon and heated over mild fire to melt it.

When the drug material starts to melt, it has to be continuously stirred by the smaller spoon and when it attains wet paste like form, it has to totally collected and placed over the ghṛtalipta kadalī patra.

Soon the paste has to be pressed for a minute with the base of gomaya poṭṭalī with downward and forward force. As a result the drug material attains thin wafer (pāpaḍa) shape.

The sandwiched wafer is later carefully collected, tested for the perfectness and stored in airtight container. The parpaṭī obtained comes with;

- Jet black color
- Shiny exterior
- Thin layer of ghee on either side and
- Imprints of kadalī patra on both sides

Note: Instead of using gomaya poṭṭalī to press on the poured kajjalī, a flat stainless steel plate base may also be used. Here the poured kajjalī will be soon covered with a ghee smeared kadalī patra and above that, the plate is placed and pressed with little force to spread the drug material sandwiched between two leaves of kadalī.

In large-scale production, we find that the liquefied drug material will be directly hurled on to a clean, stony, smooth and even surface and later collected as flakes when it is dry. This practice is usually seen with kṣāra parpaṭī (śweta parpaṭī).

**Comment:**

- The parpaṭī preparation method explained above is unique. While preparing one needs to take very little quantity of kajjalī (around 20 gms) at once.
- Preparation of parpaṭī with this classical method seems appropriate only when it is prepared in smaller quantities; but to prepare the same in larger quantity (for few kgs of kajjalī) will be a laborious and tiresome job.

- Therefore, an alternative method needs to be developed which suits better for large-scale production of parpaṭī preparations. This needs to be done to popularize and make it easily available in the market. The present usage of these parpaṭī preparations in general practice is minimal, in order to boost its therapeutic usage we need to think on these lines.

**Significance of gomaya and kadalī patra:**

It is claimed by many classical books and commentators that the gomaya used during parpaṭī preparation contribute in enhancing the potency of end product. It is said that the gopitta from gomaya, through kadalī patra will have its influence on the medicine prepared and help in curing the disease conditions of pitta-kṣīṇatā (mandāgni) in humans.

This fact is not substantiated by enough studies and research material. Until than these claims are to be termed hypothetical and subjected for further studies.

As per kadalī patra is concerned, this acts as barrier between gomaya and the parpaṭī during preparation. Kadalī patra is selected, because it is very much convenient in this situation as it is smooth, wide, thin and tensile.

For the matter of fact, any wider leaf, which is non-poisonous, may be used here for the purpose, provided it possesses all the above said advantages of kadalī patra.

**Parpaṭī pāka:**

मृदुर्मध्यः खरश्चेति पाकोऽत्र त्रिविधः स्मृतः । आद्यौ प्रयोजयेद्वैद्यः खरन्तु विषवत्त्यजेत् ।।

(R. T. 6/138)

Parpaṭī pāka will be obtained in three types depending on the heat applied while liquefying kajjalī. Mild, moderate and severe heat applied during the process of kajjalī liquefaction leads us to mṛdu, madhyama and khara pāka respectively;

Among these mṛdu and madhyama pāka parpaṭī are considered therapeutically fit. However, while preparing one should always aim to attain it in madhyama pāka.

All these mṛdu and madhyama pāka parpaṭī are indicated in 'grahaṇī roga' and other wide range of diseases. However, khara pāka parpaṭī is said to be therapeutically unfit and needs to be discarded.

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### Parpaṭi pāka parīkṣā:

The parpaṭī pāka is assessed at two stages of the process, first, during the process of heating or liquefying the kajjalī and the second when parpaṭī is formed. These assessments are called as below;

1. Pākakālīna parīkṣā
2. Pākānantara parīkṣā

Pākakālīna parīkṣā:

The parpaṭī prepared is going to be of mṛdu, madhyama or khara pāka, this will be anticipated by keenly observing the liquefied kajjalī during the preparation. This is said to be the pākakālīna parīkṣā.

| Pāka | Lakṣaṇa (symptoms) |
|---|---|
| Mṛdu pāka | • If liquefied kajjalī attains mayūra-candrikā varṇa (light greenish blue or turquoise colour) then it will be mṛdu pāka parpaṭī.<br>मयूरचन्द्रिकाकारं लिङ्गं यत्र तु दृश्यते ।<br>(B. R. 8/413 (Rasa parpaṭī) and 8/466 (Vijaya parpaṭī)) |
| Madhyama pāka | • If liquefied kajjalī attains tailavat (oily) consistency, then the parpaṭī will be of madhyama pāka.<br>निर्धूमबदरकाष्ठाङ्गारे न्यस्तं विलाप्य तैलसमम् ॥<br>(Rasa parpaṭī, B. R. 8/411)<br>तावत् च स्थाप्यते यावत्तैलाभो जायते रसः ।<br>(Tāmra parpaṭī; R.Y.S. I part; prep no 14) |
| Khara pāka | • If liquefied kajjalī attains rakta varṇa (blood red color), then the parpaṭī may be of khara pāka.<br>रक्तवर्णं भवेद्यावत्तावत्पाच्यं प्रचालयेत् ।<br>(Rudra parpaṭī; R. Y. S. II part; prep no 188) |

Pākānantara parīkṣā:

Whether the prepared parpaṭī is of mṛdu, madhyama or khara pāka will be tested by some of the signs exhibited by it. This is said to be the pākānantara parīkṣā

| Pāka | Lakṣaṇa (symptoms) |
|---|---|
| Mṛdu pāka | • Mṛdu pāka parpaṭī is smooth and solid. It bends when tilted but does not break as anticipated.<br>मृदौ न सम्यग् भङ्गः । (Vijaya parpaṭī, B. R. 8/467);<br>मृदुपाकोऽभङ्गो । (Rasa parpaṭī; R. R. S. 11/72 commentary)<br>मृदुपाको न भङ्गः । (R. T. 6/139)<br>• It is therapeutically useful.<br>मृदुमध्यो तथा खाद्यो । (Vijaya parpaṭī, B. R. 8/467) |

| Pāka | Lakṣaṇa (symptoms) |
|---|---|
| Madhyama pāka | • Madhyama pāka parpaṭī easily breaks with even edges, which appear, even and silvery.<br>मध्यपाकः सरलः । (Rasa parpaṭī; R. R. S. 11/72 commentary)<br>स्यात्तत्सरलञ्च मध्यमे । (R. T. 6/139)<br>मध्ये भङ्गश्च रौप्यवत् । (Vijaya parpaṭī, B. R. 8/467)<br>• It is therapeutically useful.<br>मृदुमध्यो तथा खाद्यो । (Vijaya parpaṭī, B. R. 8/467) |
| Khara pāka | • Khara pāka parpaṭī will be rough, hard and light weighted. It breaks into dry powder and will be of reddish color.<br>खरे लघु भवेद्भङ्गो रूक्षश्लक्ष्णोऽरुणच्छविः ।<br>(Vijaya parpaṭī, B. R. 8/467)<br>खरपाकश्च रक्तो । (Rasa parpatī; R. R. S. 11/72 commentary)<br>खरे चूर्णञ्च लोहितम् । (R. T. 6/139)<br>• This is unfit for therapeutic use and may cause some untoward influences on the body if used.<br>खरस्त्याज्यो विषोपमः । (Vijaya parpaṭī, B. R. 8/467)<br>खरन्तु विषवत् त्यजेत् । (R. T. 6/138) |

**Indications of parpaṭī:**

सहपानानुपानानां वैशिष्ट्यादिह कज्जली । सर्वामयहरा वृष्या मता दोषत्रयापहा ।।

(R. T. 6/112)

With suitable sahapāna or anupāna (adjuvant), kajjalī has the ability to cure all most all types of disease conditions. It is a good aphrodisiac and pacifies all the three doṣa.

There are varied numbers of parpaṭī preparations explained by different classical texts. These preparations are widely indicated in grahaṇī roga, āmaśūla, atisāra, pravāhikā, all types of arśa, yakṣmā, śotha, kāmalā, pāṇḍu, plīharoga, gulma, jalodara, pittaja śūla, amlapitta, vātarakta, chardi, bhrama, all types of kuṣṭha, all types of prameha, viṣama jwara, all types of ajīrṇa, agnimāndya and aruci.

**Usage, dosage and adjuvant:**

The usage of parpaṭī or its administration is carried out in two specific ways as below;

| Sāmānya prayoga | Kalpa prayoga |
|---|---|
| • Here the parpaṭī preparations are prescribed in the dosage of 1 to 2 rattī (125 mgs to 250 mgs) until the disease symptoms are controlled or as per the advice of the physician. | • In this the parpaṭī is prescribed in specific manner. Starting from the dosage of one rattī on day first, daily one rattī of the medicine is increased up to 10 days. Later one rattī is daily reduced and brought back to one rattī dosage and stopped. The course of treatment here will be of 20 days. (It may also be started from 2 rattī, up to 12 rattī; R. T. 6/143) |
| • In any indicated acute disease condition this dosage is advisable. | • This kind of administration is usually taken up in cases of chronic disease conditions, taking into consideration the strength and sustaining capacity of the patient to these preparations. |
| • It is given twice or thrice daily with suitable adjuvant such as buttermilk, fried jīraka cūrṇa etc. | • It may be advised for 36, 40, 60 and 96 days and may be repeated for more than once with sufficient gap in between two courses. |
| • Much emphasis is not laid over the dietary regimen in this case. | • Here the dietary restrictions are advised during the treatment period. Patient is asked to restrict, rice, salt, and water (R. T. 6/154 and 161). He is advised to consume milk and butter milk as required (R. T. 6/155-160). |
| • This method of prescription suits better for OPD level treatment. | • This method suits better for IPD level of treatment. |

**Adverse drug reactions (ADRs) and antidotes:**

As such, no adverse drug reactions are documented for any of the genuinely prepared and marketed parpaṭī rasāyana kalpa when they are administered in correct dosage in right disease conditions.

Use of substandard/adulterated raw materials, inappropriate dravya śodhana, lacuna in SOP (standard operation procedure) and poor storage of the products may any way taint the end product leading to ADRs. Administration of the medicine in higher dosage for prolonged time period may also lead to untoward drug toxicities.

The acute adverse drug reactions are extremely rare but in very small number of patients, the ADRs may include nausea, dryness of mouth, burning sensation, giddiness, allergic skin rashes and dyspnoea.

Acute ADRs readily come to the notice of the physician but chronic ADRs, such as kidney or liver toxicity, though rare, often go undetected.

Some of the antidotes mentioned in our classics for any acute ADR are; the godugdha, yaṣṭimadhu kaṣāya, sārivā hima, ikṣurasa, madhu and ghṛta; administered in desired quantity until the symptoms subside.

Note: Pharmacovigilance is gaining importance among doctors and scientists, as the public awareness is high towards the medicines consumed. Rarer side effects and ADRs often remain unknown at the time a drug enters the market. It may be because of limited clinical trials carried out on limited population. Therefore, the post marketing pharmacovigilance is also gaining importance. Post marketing pharmacovigilance uses tools such as data mining and investigation of case reports to identify the relationships between drugs and ADRs.

### Standardization parameters for general quality assessment of parpaṭī rasāyana kalpa:

Some of the standardization parameters for general quality assessment of parpaṭī rasāyana, recommended by CCRAS (Central Council for Research in Āyurveda and Siddha) and Dept of AYUSH, Ministry of Health and Family welfare; Government of India; are as below:

1. Organoleptic characters
2. Identification
3. Solubility
4. pH value
5. Specific gravity at 25° C
6. Melting temperature
7. Ash value/Acid insoluble ash
8. Water soluble/Alcohol soluble extractives
9. Test for heavy materials
10. TLC/HPTLC
11. Assay for elements
12. Microbial contamination

Note: Kindly find the examples of **'Parpaṭī rasāyana'** and their explanation in the 25th chapter named 'Aūṣadha Yoga'.

## (III) POṬṬALĪ RASĀYANA KALPANĀ

All the four major rasāyana kalpanā such as Kharalīya rasāyana, Parpaṭī rasāyana, Poṭṭalī rasāyana, Kupīpakwa rasāyana have their own significance and wider range of therapeutic utility.

Out of these, 'poṭṭalī rasāyana kalpanā' is the one which is distinctive in its own way. It is widely known for its specific methods of preparation, unique end product, optimum potency, smaller dosage and larger therapeutic applicability.

**Poṭṭali- synonyms:**

> विस्तारितस्य वस्तुनः अल्पो भवनं पोट्टम् । पोट्टलाति गृण्हाति इति पोट्टली ।।
>
> (Pārada Vijñānīyam page 168)

The concept deveioped to obtain the spread out drug material into a dense, tough and compact form is called as poṭṭalī kalpanā.

**Poṭṭali kalpanā - brief history:**

The preservation and storage of prepared medicine was always a challenge in olden days. The methods they adopted for the storage did not always provide full safety to the medicines especially during transportation. The brittle mud or fragile glass containers which were used for storage, frequently crumbled during transportation leading to the spillage and wastage of the products.

The thought process to overcome this wastage of medicine eventually led to the innovation, development and growth of poṭṭalī rasāyana kalpanā. In poṭṭalī kalpanā the end product is in hardened bolus or poṭṭalī form and does not go waste when containers break. The poṭṭalī pieces may be easily collected back and restored.

Now-a-days when there are enormous advancements in the field of package and transportation of the finished products, the above said theory behind inception of poṭṭalī kalpanā may not seem relevant. But these poṭṭalī formulations do remain advantageous in the same way as they were earlier.

The poṭṭalī formulations may be traced back from 12th century in a book named Rasaratnākara written by Ācārya Nityanāth. Later in 13th century we find few more references and further in 14th century maximum number of poṭṭalī kalpanā are being explained by different books. The same legacy is continued in many books in the later centuries.

Many formulations are reproduced from older books with desired changes in the methods of preparation and therapeutic approach as per the requirement of that particular era. All in all around 70 poṭṭalī kalpanā may be listed out taking into consideration all the available references.

The below table provides various poṭṭalī kalpanās in chronological order.

| **Century** | **Book name** | **Author** | **Poṭṭalī preparations** |
|---|---|---|---|
| 12th | Rasa-ratnākara | Ācārya Nityanātha | Ratna garbha poṭṭalī<br>Śaṅkha garbha poṭṭalī |
| 13th | Rasendra-sāra-saṅgraha | Ācārya Gopāla Kṛṣṇa Bhaṭṭa | Ratna garbha poṭṭalī<br>Lokeśvara poṭṭalī<br>Hemagarbha poṭṭalī<br>Grahaṇī kaparda poṭṭalī<br>Haṁsa poṭṭalī |
| 13th | Rasa-prakāśa-sudhākara | Ācārya Yaśodhara | Mṛgāṅka poṭṭalī<br>Hemagarbha poṭṭalī (prathama and dwitīya)<br>Vajra poṭṭalī<br>Rājamṛgāṅka poṭṭalī<br>Lokanātha poṭṭalī |
| 14th | Rasaratna-samuccaya | Ācārya Rasa Vāgbhaṭa | Mṛgāṅka poṭṭalī<br>Poṭṭalī rasa<br>Vaiśvānara poṭṭalī<br>Hemagarbha poṭṭalī<br>Gandhaka marda poṭṭalī - I & II |
| 14th | Rasendra-cintāmaṇi | Ācārya Ḍhuṇḍhuka Nātha | Ratna garbha poṭṭalī<br>Haṁsa poṭṭalī<br>Lokeśvara poṭṭalī |
| 14th | Rasa-cintāmaṇi | Ācārya Anantadeva Sūri | Lokeśa poṭṭalī<br>Laghu poṭṭalī<br>Kāñcana poṭṭalī<br>Śaṅkha poṭṭalī<br>Hiraṇya-garbha poṭṭalī<br>Pañcāmṛta poṭṭalī |
| 14th | Rasa-kaṅkālīya | Kaṅkāla Yogī | Kanaka poṭṭalī rasa<br>Mṛgāṅka rasa<br>Lokanātha rasa<br>Śaṅkhagarbha rasa<br>Hiraṇya poṭṭalī rasa |

| Century | Book name | Author | Poṭṭalī preparations |
|---|---|---|---|
| 14th | Rasāvatāra | Ācārya Māṇikya Candra Jain | Mṛgāṅka poṭṭalī<br>Ratnagarbha poṭṭalī<br>Lokanātha poṭṭalī |
| 14th | Śārṅgadhara-saṁhitā | Ācārya Śārṅgadhara | Mṛgāṅka poṭṭalī<br>Hemagarbha poṭṭalī - I & II |
| 16th | Bhāvaprakāśa | Ācārya Bhāvamiśra | Śaṅkhagarbha poṭṭalī |
| 16th | Rasakoumudī | ---- | Ratnagarbha poṭṭalī<br>Śaṅkhagarbha poṭṭalī |
| 17th | Rasakāmadhenu | Ācārya Cūḍāmaṇi | Ratnagarbha poṭṭalī<br>Mṛgāṅka poṭṭalī<br>Hiraṇyagarbha poṭṭalī<br>Hemagarbha poṭṭalī - I & II<br>Lokeśvara poṭṭalī<br>Lokanātha poṭṭalī<br>Śaṅkhagarbha poṭṭalī |
| 17th | Yogaratnākara | Ācārya Dakṣiṇātya (unknown) | Ratnagarbha poṭṭalī<br>Lokeśvara poṭṭalī<br>Hemagarbha poṭṭalī - I, II, III and IV |
| 18th | Bṛhadyogataraṅgiṇī | Ācārya Trimalla Bhaṭṭa | Ratnagarbha poṭṭalī<br>Lokeśvara poṭṭalī |
| 18th | Bhaiṣajya-ratnāvalī | Ācārya Govinda Dāsa | Ratnagarbha poṭṭalī<br>Lokeśvara poṭṭalī<br>Haṁsagarbha poṭṭalī<br>Hiraṇyagarbha poṭṭalī<br>Hemagarbha poṭṭalī |
| 19th | Nighaṇṭu-ratnākara (1967) | Vaidya Goḍabole | Mṛgāṅka poṭṭalī<br>Ratnagarbha poṭṭalī<br>Lokanātha poṭṭalī<br>Śṅkhagarbha poṭṭalī - I & II<br>Hemagarbha poṭṭalī I & II |
| 19th | Rasāyana-saṅgraha | Compiled book | Mṛgāṅka poṭṭalī<br>Ratnagarbha poṭṭalī<br>Haṁsa poṭṭalī<br>Śṅkhagarbha poṭṭalī<br>Hiraṇyagarbha poṭṭalī<br>Mahāhemagarbha poṭṭalī<br>Apūrva hemagarbha poṭṭalī<br>Śveta hemagarbha poṭṭalī<br>Pīta heagarbha poṭṭalī<br>Hemagarbha rasāyana poṭṭalī |

| Century | Book name | Author | Poṭṭalī preparations |
|---|---|---|---|
| 19th | Siddha-bhaiṣajya Maṇimālā | Ācārya Kṛṣnarāma | Hemagarbha poṭṭalī<br>Retorodhana poṭṭalī<br>Netra poṭṭalī |
| 20th | Rasāyana Sāra | Śyāmasundarācārya | Netra poṭṭalī<br>Hemagarbha poṭṭalī<br>Swarṇagarbha poṭṭalī |

Note: Other than the references given in the table above, we may find few other books of recent past which explain poṭṭalī kalpanā. But practically these formulations are seldom prepared and therapeutically utilized.

Presently no pharmaceutical company is marketing any of these products. One needs to ponder over the reasons for prevailing unpopularity of these formulations in the therapeutic world.

**Different shapes of poṭṭalī:**

When different classical preparations of poṭṭalī kalpanā are explored, one finds the following references in relation with the shape, size and quantity of the poṭṭalī;

- शिखरारम्भिका कार्या । (Hiraṇyagarbha poṭṭalī; R. Yo. Sā. II part; 'ha' kārādi rasa 634); the poṭṭalī is prepared in the form of a stout cone.
- पूगमात्रा गुटीः कृत्वा वेष्टयेत् क्षौमवाससा । (Hiraṇyagarbha poṭṭalī; R. Yo. Sā. II part; 'ha' kārādi rasa 637);
- पूगीफलेन सदृशी वंटिका विधाय । (Hiraṇyagarbha poṭṭalī; R. Yo. Sā. II part; 'ha' kārādi rasa 641); the poṭṭalī is prepared in the shape of 'areca nut'.
- गुटिकां कारयेत्तान्तु बन्धीयात्खरकर्पटे । गुंटिकां कारयेत्ततः । (Hiraṇyagarbha poṭṭalī; R. Yo. Sā. II part; 'ha' kārādi rasa 632, 633); the poṭṭalī is prepared in the form of guṭikā.
- पट्टकूले दृढे बद्धा कर्षमानाश्च वर्तिकाः । (Hiraṇyagarbha poṭṭalī; R. Yo. Sā. II part; 'ha' kārādi rasa 638); 12 gms of drug in wick form.

Comment: The explanations in relation with the different shapes and sizes of poṭṭalī come with no uniform approach. No matter what the shape of the poṭṭalī is, the amount of heat applied to it during the procedure and the amount of heat received by each particle of the poṭṭalī is the matter of significance.

In this context one needs to specify the amount of drug to be incorporated in each poṭṭalī prepared and go with its best suitable shape in which the temperature is evenly available to all the parts of the poṭṭalī.

## GENERAL METHODS OF POṬṬALĪ KALPANĀ

Poṭṭalī kalpanā comes with diverse methods of preparation. The major books which deal with these formulations, explain their method of preparation in their own unique way. The prominent methods employed for poṭṭalī kalpanā by renowned books may be enlisted as below;

(I) Gandhakadrāva swedana method
(II) Kaparda pūraṇa method
(III) Puṭapāka method
(IV) Vālukā yantra method

**(I) Gandhakadrāva swedana method (General procedure):**

1. The drugs mentioned in poṭṭalī kalpanā usually include śuddha pārada and śuddha gandhaka along with few other bhasma dravya.
2. Kajjalī has to be prepared by triturating all these mentioned drugs for 3 to 4 days or until all the appropriate kajjalī lakṣaṇa are appreciated in it.
3. This kajjalī may be triturated in khalva yantra/tapta khalva yantra with any of the mentioned liquid/liquids.
4. The drug mass is put together to give it a shape resembling either betel nut or a stout cone like shape or any other shape specified in the preparation.
5. This bolus has to be dried for a day or two so that it attains desired hardness to withstand the further processes (*sūryātape khare śoṣyaṁ*).
6. Now a clean, strong and thick silk cloth of one square foot has to be taken (*veṣṭyet kṣoumavāsasā*).
7. It is spread on an even surface and on it around one tolā (12 gms) of śuddha gandhaka cūrṇa is placed right in the middle of the cloth.
8. Place the dried drug bolus over this cūrṇa and cover it with another 2 tola (24 Gms) of śuddha gandhaka cūrṇa.
9. Carefully collect and lift all the four corners of the cloth and tie a neat and tight poṭṭalī.
10. Meanwhile take one iron bowl shaped vessel (*āyase pātre paktvā*- Yoga Ratnākara) which is deep and not so wide. (mṛtpātra/mṛtmūṣā is asked to be used as per the text Rasāmṛta).
11. Put around 250 gms of śuddha gandhaka cūrṇa into bowl.
12. Now place the bowl on mild fire and continuously heat over mild fire (mandāgni) to liquefy all the gandhaka and see that the poṭṭalī gets completely immersed into it.

13. Maintain the temperature just above the melting point of sulphur (119.20⁰ C) and well below its boiling point (200⁰ C) so that the pāka of poṭṭalī is appropriate.
14. Place the poṭṭalī in liquefied gandhaka and keep rolling it in the bowl continuously or suspend it into the bowl with the help of a small rod placed across mouth of the bowl.
15. The heating is usually continued for 30 to 60 minutes and meanwhile more gandhaka cūrṇa may be added to the bowl as its quantity depletes.
16. The confirmatory tests for poṭṭalī pāka are;
    - The color of boiling gandhaka turns to vyoma varṇa (sky blue color) (*vyomavarṇa tu gandhakam*).
    - The poṭṭalī produces metallic sound when lifted from vessel and gently swung to hit on any empty metallic vessel.
    - Initially the sound will be dull and as the samyak pāka is attained, it turns resonant.
17. Later, when the poṭṭalī is self-cool, it is taken out, the gandhaka surrounding it is scraped out and the hard drug mass is collected and stored in airtight glass containers for further therapeutic use. The poṭṭalī is not expected to be brittle and it should withstand the packaging and transportation.

**(II) Kaparda pūraṇa method (General procedure):**

1. Kajjalī has to be prepared by triturating all the mentioned drugs for 3 to 4 days or by triturating until all the appropriate kajjalī lakṣaṇa are appreciated.
2. This kajjalī may be triturated with any of the mentioned liquid/liquids to obtain it in wet drug mass form, in a khalva yantra.
3. Meanwhile clean, bigger sized yellow cowries are selected in required numbers and kept ready.
4. The drug mass prepared is carefully and very neatly filled into these selected cowries.
5. The mouth of the cowries should be closed with ṭaṅkaṇa (borax) paste prepared by triturating with any mentioned liquid.
6. They are dried, placed in a śarāva of appropriate size and another śarāva of same size is used to prepare śarāva sampuṭa with proper sandhibandhana.

7. This śarāva sampuṭa is now subjected for one gajapuṭa using cow dung cakes as per the reference.
8. When it is cool on its own, the cowries inside the sampuṭa are taken out; the ṭaṅkaṇa smeared on them is removed.
9. They are triturated along with the cowry part to obtain the end product.
10. The end product is later stored in airtight glass containers for further therapeutic use.
11. The poṭṭalī is not expected to be brittle and it should withstand the packaging and transportation.
12. If marketed the stored end product has to be neatly labeled with all the details required.

**(III) Puṭapāka method (General procedure):**

1. Mentioned quantities of śuddha pārada and śuddha gandhaka are taken in a clean khalva yantra and triturated for 3 to 4 days to obtain appropriate kajjalī.
2. This kajjalī along with any other mentioned drug is subjected to bhāvanā with mentioned bhāvanā dravya for specified time period to prepare the pills of 'badara' size or any other size mentioned.
3. These pills are taken into a mud pot of appropriate size, which is smeared with sudhā cūrṇa.
4. The pot is closed with a lid (śarāva) of correct size which is also smeared with sudhā cūrṇa.
5. After proper sandhi-bandhana it is allowed to dry and later subjected for mentioned puṭa using dry cow dung cakes.
6. After it cools down on its own, the drug material inside is collected, again subjected for a day's trituration with other mentioned drugs and pills of same size are prepared.
7. The process of puṭa application is repeated in the same manner for mentioned number of times.
8. At the end the drug material is collected, triturated and stored in airtight glass containers for further therapeutic use.

**(IV) Vālukā yantra method (General procedure):**

1. Kajjalī has to be prepared by triturating all the mentioned drugs for 3 to 4 days or by triturating until all the appropriate kajjalī lakṣaṇa are appreciated.

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2. This kajjalī has to be triturated in a clean khalva yantra with any of the mentioned liquid/liquids.
3. The drug mass is put together to give it a shape resembling either betel nut or a stout cone like shape or any other shape specified in the preparation.
4. This bolus has to be dried for a day or two so that it attains desired hardness to withstand the further processes (*sūryātape khare śoṣyam*).
5. Now a clean, strong and thick silk cloth of one square foot has to be taken (*veṣṭayet kṣoumavāsasā*).
6. It is spread on an even surface and on it around one tolā (12 gms) of śuddha gandhaka cūrṇa is placed right in the middle of the cloth.
7. Place the dried drug bolus over this cūrṇa and cover it with another 2 tolā (24 gms) of śuddha gandhaka cūrṇa.
8. Carefully collect and lift all the four corners of the cloth and tie a neat and tight poṭṭalī.
9. The poṭṭalī is placed right in the middle of either in vālukā yantra or lavaṇa yantra.
10. Now heat is applied to vālukā yantra continuously for three prahara (12 hrs).
11. Later when it cools down on its own, the poṭṭalī is taken out and the drug inside is stored in moist proof polythene bags or airtight glass containers for further therapeutic use.

**Marketing of the formulation:**

If these preparations are marketed the stored end product has to be neatly labeled with all the details about the preparation such as; name of the preparation in big capital letters, reference, indication, contents (separate literature is placed if more ingredients), dose, adjuvant, batch number, registration number, name of the manufacturer and address, date of manufacture, date of expiry, prize of the product, toll free customer care number, email address and advise to keep the drug in a cool and dry place.

**Adverse drug reactions (ADRs) and antidotes:**

No adverse drug reactions are documented for any of the poṭṭalī rasāyana kalpa as of now. Because, no pharmaceutical company has marketed these products in past or any company is marketing them presently on larger scale. Though these products are claimed to be quite potent and effective; why they are not in use? Why they are not produced and marketed by pharmaceutical companies? are the question to be posed at ourselves.

### Standardization parameters for general quality assessment of poṭṭalī rasāyana:

Some of the standardization parameters for general quality assessment of poṭṭalī rasāyana are:

1. Organoleptic characters
2. Identification
3. Hardness
4. Disintegration time
5. Melting temperature
6. Loss on drying at 105° C
7. Ash value/Acid insoluble ash
8. Water soluble/Alcohol soluble extractives
9. Test for heavy toxic materials
10. Assay for elements

Note: Kindly find the examples of **'Poṭṭalī rasāyana'** and their explanation in the 25th chapter named 'Aūṣadha Yoga'.

## (IV) KŪPĪPAKWA RASĀYANA

Kupīpakwa rasāyana kalpanā have always been known for their absolute potency and smaller dosage. They are largely produced and marketed by pharmaceutical companies. These formulations have very wider range of therapeutic utility.

### Kupīpakwa rasāyana- definition:

कूपी इति काचकूपी-पक्वं अग्निना पक्वं-रसस्य पारदस्य-अयनं स्थानम् ।

The term kūpī indicates suitable glass bottle; pakwa means pāka in agni; rasa term stands for pārada; and ayana means sthāna;

कुप्यम् अग्निनां पक्वं यद्रसायनं तत कूपीपक्वरसायनम् ।

The formulations prepared by subjecting śuddha pārada, śuddha gandhaka and any of the other rasadravya to a specific heat in any selected glass bottle following the unique method of preparation mentioned in the books is called as kūpīpakwa rasāyana.

Brief history:

The first reference of kūpīpakva rasāyana may be traced from a book of 13th century named 'Rasaprakāśa Sudhākara' written by Śrī Yaśodhara.

In this book the author has explained a preparation named 'Udayabhāskara rasa' in which he mentions about the kācaghaṭī (kācakūpī) and sikatāyantra (vālukā yantra); रुचिरकाचघटीविनिविशितौ सिकतायन्त्रवरेण दिनत्रयम् ।। (R. P. S. 3/13); The same author mentions 'Rasakarpūra' in the name of 'ghanasāra rasa' (R. P. S. 3/3-9).

A 14th century book named Rasacintāmaṇi written by Śrī Ānandadeva Sūri explains the reference of Rasapārthiva rasa which is a kūpīpakva rasāyana.

From a book of 16th century named 'Rasakaumudī evam Rasakalpayoga' and a 17th century book named 'Āyurveda Prakāśa' we find these formulations explained under the heading 'sindūra rasa'.

Rasataraṅgiṇī—a book of 20th century deals with many kūpīpakva rasāyana kalpa. Most all the recent books have endorsed the same references.

Kūpīpakva rasāyana perhaps has developed from the concept of gandhaka jāraṇa (the digestion of sulphur into mercury) which was for the first time explained in a book of 9th century by name 'Rasahṛdaya Tantra'.

Sulphur in different ratios (equal, double, triple, four five or six times to that of mercury) is subjected to specific amount of heat (around 270° C) along with mercury to obtain a different compound as that of sindūra. These sindūra formulations might have led to the inception of kūpīpakva rasāyana kalpa.

**Categorization of kūpīpakva rasāyana yoga:**

Here categorization is based on different factors as given below;

I) Depending on presence of gandhaka as an ingredient these formulations may be categorized into two groups;

1. Sagandha: Those which contain gandhaka as an ingredient.
   Ex: Rasasindūra, Makaradhwaja rasa, Siddhamakaradhwaja rasa, Māṇikya rasa, Samīrapannaga rasa, Svarṇavaṅga, Tāmra sindūra, Rajata sindūra, Malla sindūra, Tāla sindūra, Śilā sindūra, Pūrṇa candrodaya, Tāla candrodaya etc.

2. Nirgandha: Those which do not contain gandhaka.
   Ex: Rasakarpūra and Rasapuṣpa.

II) Categorization depending on the place of medicine accumulation in kācakūpī (auṣadha prāpti sthāna):

1. Galastha or kaṇṭhastha: Medicine accumulated at the neck of the bottle.
   Ex: Rasasindūra, Rasa karpūra, Malla sindūra.

2. Talastha or adhaḥstha: Medicine accumulated at the base of the bottle.
   Ex: Samīrapannaga rasa, Rasasindūra.
3. Ubhayāstha: Medicine accumulated both at neck and the base of the bottle.
   Ex: Māṇikya rasa, Pūrṇacandrodaya rasa.

III) Categorization depending on the method of preparation adopted:

1. Bahirdhūma vidhi: Kūpīpakva method.
   Ex: Rasasindūra, Rasa karpūra, Malla sindūra etc.
2. Antardhūma vidhi: Śarāva sampuṭa method.
   Ex: Rasasindūra, Rasa karpūra etc.

**Kūpīpakva rasāyana kalpa:**

The essential requirements:

**1. Auṣadha dravya (raw drugs):**

The necessary drugs required in these preparations are śuddha pārada and śuddha gandhaka; dhātu bhasma or dhātu patra (metallic foils); any of the other rasadravya; gandhakāmla, saindhava lavaṇa etc.

Bhāvanā dravya required are the swarasa, kwātha of any herbal drug or any other liquid media particularly mentioned in the preparation.

**2. Kāca kūpī (glass bottle):**

The glass bottle which is most convenient and quite regularly selected for this purpose is the beer bottle of 650 ml capacity. It will be lengthy, round and firm based with elongated neck and usually amber colored.

**3. Kūpī stand:**

It is a stand to keep the bottles tilted or inverted after washing. It is useful to dry the bottles and to cover them with wet mud and cloth.

**4. Vastra (cloth):**

Clean and strong cotton cloth of enough width to cover the glass bottle. This is used for the purpose of covering the bottle after smearing with wet clay.

**5. Multānī clay, vastra (cloth) and mṛtvastralepana:**

Clean and soft multānī clay and cotton cloth pieces of required size are taken here for the purpose of preparing mṛtvastralepita kācakūpī. Seven layers of mṛtvastralepana have to be done. It has to be dried after each lepana (covering). Since multānī clay is by nature fine, soft and sticky it is useful here for the purpose.

### 6. Vālukā yantra:

It is a bucket shaped cost iron vessel of bigger size with 1 inch thick surrounding body and 2 inches thick base. It needs to have two strong handles above for the purpose of lifting it.

If this kind of iron vessel is unavailable, then any strong mud flower pot of similar size may be used here for the purpose after coveting it 7 times with wet mud and cloth. Every second covering should be put after the first one is dry.

Note: Considering the amount of heat applied in these preparations, only cost iron vessel can withstand the heat quite effectively. Other alternative arrangements are only transitory.

### 7. Vāluka (sand):

Sand selected here to fill into the vālukā yantra is expected to be clean, filtered and uniform as it is the media of regulated heat transmission in the process. It should not be mixed with mud or gravel.

### 8. Loha śalākā (thin iron rod):

A thin iron rod of around 3 to 4 feet length is selected. One end of it is heated red hot and used to clean the mouth of the bottle when the drug fumes block it during the process of heating.

### 9. Agni bhaṭṭī (fire chamber):

It is the fire place specially designed and constructed for the purpose of heating the vālukā yantra firmly fixed over it. The construction is done on the ground with mud or cement bricks.

Its length, breadth and height are expected to be around 4 to 5 feet. On the superior portion an opening only to accommodate the base of vālukā yantra is left, the neck and the handles of the vessel should remain above the surface.

From one side in the lateral wall there should be a round shaped larger opening to feed the fuel (coal, wood etc). The place of fuel inside is expected to be spacious and include maximum base of the vālukā yantra placed above. This chamber is fixed with one or two cement wind pipes for the safe escape of smoke. This fire chamber may also be done underground in the similar manner.

In this fire chamber the agni of mṛdu, madhyama and tīkṣṇa intensity is respectively given for 6 hours each to the vālukā yantra containing the mṛtkapaṭita auṣadhayukta glass bottle;

| Agni | Temp | Changes in the bottle |
|---|---|---|
| Mṛdu agni | $150^0$ to $250^0$ C | • The mouth of the bottle is kept open.<br>• The kajjalī starts to melt.<br>• Fumes gradually begin to come up from the bottle. |
| Madhyama agni | $250^0$ to $500^0$ C | • The kajjalī starts to boil as a result of which fumes emerge gradually followed by flames.<br>• When the neck of the bottle gets blocked, it has to be frequently cleared by carefully inserting the hot iron rod (tapta śalāka) selected for the purpose.<br>• Both fumes and flames subside at one point.<br>• If the base of the bottle is visualized at this stage in torch light by keeping the surrounding dark, it appears deep red.<br>• The new compound formation is anticipated at this stage. |
| Tīkṣṇa agni | $500^0$ to $650^0$ C | • The bottle is carefully corked when all the fumes and flames arising are ended.<br>• Here the new compound formed rises up and gets collected at the neck of the bottle. |

**10. Electric furnace:**

The modern version of fire chambers and vālukā yantra are the electric furnaces. These will be both vertical and horizontal. The vertical one is useful for kūpīpakva rasāyana.

These come with strong and safer body built with electric coils inside to produce the desired temperature for required amount of time. It comes with a temperature regulator.

After switching off the temperature inside the furnace doesn't come down abruptly. It takes more than 12 hours for the furnace to cool down on its own.

Comment: When temperature regulation is completely out of our hands in conventional method of preparation, these instruments lead us to more sophisticated and authentic way of medicine preparation. Majority of pharmaceutical companies rely on these furnaces now-a-days and as such no disadvantages of these instruments are seen in comparison with the traditional method explained in classics.

**Kūpīpakva rasāyana vidhi:**

(General method of preparation)

1. If śuddha pārada and śuddha gandhaka are the ingredients, they are taken

in a khalva yantra and triturated continuously for 4 to 5 days until appropriate kajjalī is obtained.

2. The kajjalī may be subjected for bhāvanā with any of the mentioned bhāvanā dravya.
3. If any metallic foils like svarṇapatra are mentioned in the preparation, they are carefully cut into smaller pieces and taken in a clean khalva yantra.
4. To it equal quantity of śuddha pārada is added and triturated rigorously for 4 to 5 days until one gets a fine butter like paste of the drug mixture.
5. And this drug mass is triturated with mentioned quantity of gandhaka and triturated again for 2 to 3 days to obtain proper kajjalī.
6. This kajjalī may also be subjected for bhāvanā with any of the mentioned bhāvanā dravya.
7. Later the bhāvita kajjalī is carefully collected and filled into the beer bottle of 650 ml capacity (lengthy, round and firm based with elongated neck and usually amber colored) selected earlier.
8. Seven layers of mṛtvastralepana has to be done to the bottle to obtain mṛtvastralepita kācakūpī, each second lepana (covering) is put only after the first one is dry.
9. See that only 1/ 4th to 1/3rd of the bottle is filled with kajjalī and the remaining part is left vacant to allow better compound formation.
10. The mouth of the bottle is closed temporarily with a cork and placed firmly in vālukā yantra with 2 inch thick sand at the base and sand up to neck in the surrounding.
11. Now agni of mṛdu, madhyama and tīkṣṇa intensity is respectively given for 6 hours each to the vālukā yantra containing the bottle.
12. The cork of the bottle has to be removed soon after beginning the heating process. Once madhyamāgni for 6 hours is applied, fumes start rising out from the mouth of the bottle.
13. In case the neck of the bottle gets blocked, it has to be frequently cleared with a hot iron rod (taptaśalāka).
14. This stage will be followed by tīkṣṇāgni of 6 hours where flames emerge out and after some time flames and fumes gradually subside and stop completely.
15. Now the cork of the bottle is re-fitted and correctly sealed with mud smeared cloth. The vālukā around the neck of the bottle is removed and allowed to cool on its own.

16. Next day the bottle is taken out from vālukā yantra and the mud and cloth covering is carefully removed and bottle is cleaned from outside.
17. After spotting the presence of the end product in the bottle, it is carefully wrecked by tying the kerosene soaked thread (of jute) around the bottle at accurate place and igniting, and later rolling the bottle in a wet cloth.
18. The prepared medicine at the neck or at the base is carefully collected in the same shape by gently stroking the part of the bottle held inverted.
19. Check whether the medicine contains any glass pieces mixed with it and later it is triturated in a porcelain khalva yantra to obtain fine powder of the same.
20. The end product may be neatly stored in a moist proof polythene bag or an airtight glass container with proper closure.

**Corking the bottle (kūpī-mukha-mudraṇa):**

The closure of bottle opening with a cork is called as kūpī-mukha-mudraṇa or mudrā. The cork is usually prepared by rolling the wet mud smeared cloth tightly into a small cork shape. It is also done by rolling a piece of chalk with the cloth and wet mud. The cork should be of 2 to 3 inch length. It should be thicker at the top and comparatively narrower below. The narrower end is inserted into the bottle mouth and fixed. The mudrā preparation is also called with other names like haṭa-mudrā and madana-mudrā.

Before placing the cork over the bottle during the process, one should carefully consider and confirm the below given points and then go for mukha mudraṇa.

1. The fumes and the flame arising from the bottle should be completely stopped indicating the complete evaporation of sulphur.
2. The cold śalākā (iron rod) inserted into the bottle should not emit any fumes when removed out, indicating that no minor amount of sulphur is adhered to it.
3. The base of the bottle should appear red when seen in torch light. It is better appreciated during night in darkness.
4. The molecules of mercury are seen rising up in circular motion inside the bottle.
5. A copper coin placed on the mouth of the bottle loses its color at the base as it comes in contact with molecules of mercury.

### Method of breaking the bottle:

The bottle in which the medicine is prepared has to be broken with all care and gentleness so that the drug inside is completely collected without any loss. The steps which one needs to follow to break the kūpī are as given below.

1. The kūpī is taken out from the vālukā yantra after it is cool on its own. The outer mud and cloth covering is cut and removed very carefully without damaging the bottle or disturbing the inner content.
2. It is cleaned and accumulated medicine inside is spotted. A jute thread (of gunny bag) soaked in kerosene is tied around the bottle where it needs to be broken. The thread is ignited, allowed to burn fully.
3. After the thread is burnt, its remaining part if any on the bottle is removed and soon the bottle is horizontally rolled in a wet cloth spread on an even surface.
4. Here the part of the bottle, hot because of the thread burnt over it is suddenly brought in contact with wet cloth. As a result of sudden change in temperature the glass breaks precisely at the areas it is intended to and while breaking a clear sound of the same is heard.
5. Later the bottle has to be rolled back from cloth; the two broken parts of the bottle are cautiously collected, held inverted and gently stroked to collect the medicine adherent inside in the same shape.

### Marketing these products:

If these products are marketed, the stored end product has to be neatly labeled with all the details about the preparation such as; name of the preparation in big capital letters, reference, indication, contents (separate literature is placed if more ingredients), dose, adjuvant, batch number, registration number, name of the manufacturer and address, date of manufacture, date of expiry, prize of the product along with toll free customer care number, email address and advise to keep the drug in a cool and dry place.

### Adverse drug reactions (ADRs) and Antidotes:

As such no adverse drug reactions are documented for any of the genuinely prepared and marketed kūpīpakva rasāyana kalpa when they are administered in correct dosage in right disease condition.

Use of substandard/adulterated raw materials, inappropriate dravya śodhana, lacuna in SOP and poor storage of the products may any way taint the end product leading to ADRs. Administration of the medicine in higher dosage for prolonged time period may also lead to untoward drug toxicities.

The acute adverse drug reactions are extremely rare but in very small number of patients the ADRs may include nausea, dryness of mouth, burning sensation, giddiness, allergic skin rashes, dyspnoea etc.

Acute ADRs readily come to the notice of the physician but chronic ADRs, such as kidney or liver toxicity, though rare, often go undetected.

Some of the antidotes mentioned in our classics for any acute ADR are; the godugdha, yaṣṭimadhu kaṣāya, sārivā hima, ikṣurasa, madhu, ghṛta etc;

Note: Pharmacovigilance is gaining importance for doctors and scientists as the public awareness is high towards the medicines consumed. Rarer side effects and ADRs often remain unknown at the time a drug enters the market. It may be because of limited clinical trials carried out on limited population. So the post marketing long term pharmacovigilance is also gaining importance.

Post marketing pharmacovigilance uses tools such as data mining and investigation of case reports to identify the relationships between drugs and ADRs.

**Standardization parameters for general quality assessment:**

Some of the standardization parameters for general quality assessment of kūpīpakva rasāyana kalpa, recommended by CCRAS (Central Council for Research in Āyurveda and Siddha) and Dept of AYUSH, Ministry of Health and Family welfare; Government of India; are as below:

1. Organoleptic characters
2. Identification
3. Particle size
4. Ash value/Acid insoluble ash
5. pH value
6. Water soluble/Alcohol soluble extractives
7. Test for heavy toxic materials
8. Assay for elements

Note: Kindly find the examples of **'Kupipakwa rasāyana'** and their explanation in the 25th chapter named 'Aūṣadha Yoga'.

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## Chapter 14

# RASA DRAVYA VARGĪKARAṆA

## (Classification of Rasa Dravya)

**Classification of rasa dravya and its rationality:**

Classification is a systematic arrangement into groups based on perceived common characteristics. In 'Rasaśāstra' along with mercury many other minerals, metals, precious stones, alkaline compounds, calcium compounds are in use for various pharmaceutical formulations.

The term 'rasa' in 'Rasaśāstra', stands for 'pārada' (mercury). This pārada is believed to be the most prominent dravya with immense therapeutic properties.

All the other remaining drugs are counted next to it, as they all, in one or the other way support in making pārada therapeutically more potent. These drugs are required in majority of the pharmaceutical procedures such as jāraṇa, bandhana, rañjana, sāraṇa, krāmaṇa etc carried out on pārada.

The remaining drugs other than 'pārada' belong to the mineral, plant and the animal sources. These drugs, by different authors are included under 'mahārasa varga', 'uparasa varga', 'sādhāraṇa rasa varga', 'dhātu varga', 'ratna varga', 'uparatna varga' etc.

All these classifications by different authors are purely based on their practical experiences. That is why it is hard to find complete uniformity in the opinions expressed about rasa dravya classification. Classification of rasa dravya is indeed a significant step towards theoretical standardization in the field of 'Rasa Śāstra'.

To find out the probable rationale behind different types of approaches in classification of rasa dravya, one needs to keenly understand the physico-chemical properties and the pharmaceutico-therapeutical utility of all these drugs. The classification of these drugs in the present 'rasa granthas' might have been based upon the following factors;

1. The pharmaceutical significance and the extent of their usefulness in pharmaceutical procedures carried out over mercury.
2. The influence of these drugs over pārada and its physico-chemical properties.

3. The presence of essence and the amount of essence present in these drugs.
4. The hardness.
5. The therapeutic utility.
6. Their availability and the feasibility.
7. Āptopadeśa—advise from wise men.

**Mahārasa:**

अभ्रवैक्रान्तमाक्षीकविमलाद्रिजसस्यकम् । चपलो रसकश्चेति ज्ञात्वाऽष्टौ संग्रहेद्रसान् ।।

(R. R. S. 2/1)

1. Abhraka 2. Vaikrānta 3. Mākṣika 4. Vimala 5. Adrija (Śilājatu) 6. Sasyaka (Tuttha) 7. Capala and 8. Rasaka; are the eight mahārasas that are widely accepted and followed.

**Uparasa:**

गन्धाश्मगैरिकासीसकांक्षीतालशिलाञ्जनम्। कङ्कुष्ठं चेत्युपरसाश्चाष्टौ पारदकर्मणि ।। (R. R. S. 3/1)

1. Gandhaka 2. Gairika 3. Kāsīsa 4. Kāṅkṣī 5. Haratāla 6. Manaḥśilā 7. Añjana and 8. Kaṅkuṣṭha; are the eight uparasa that are widely accepted and followed.

**Sādhāraṇa rasa:**

कम्पिल्लश्चापरो गौरीपाषाणो नवसादरः । कपर्दो वह्निजारश्च गिरिसिन्दूरहिङ्गुलौ ।।
मृद्दारश्रृङ्गमित्यष्टौ साधारणरसाः स्मृताः । रससिद्धिकराः प्रोक्ता नागार्जुनपुरःसरैः ।।

(R. R. S. 3/126-127)

1. Kampillaka 2. Gourīpāṣāṇa 3. Navasādara 4. Kaparda 5. Vahnijāra 6. Girisindūra 7. Hiṅgula and 8. Mṛddāraśṛṅga; are the eight sādhāraṇa rasa that are widely accepted and followed.

**Loha (Dhātu):**

शुद्धं लोहं कनकरजतं भानुलोहाश्मसारम् ।
पूतीलोहं द्वितयमुदितं नागवङ्गाभिधानम् । मिश्रं लोहं त्रितयमुदितं पित्तलं कांस्यवर्तम् ।।

(R. R. S. 5/1)

The table below, shows the nine 'dhātus' and their classification.

| Śuddha loha 4 | Pūti loha 2 | Miśra loha 3 |
|---|---|---|
| Swarṇa | Nāga | Pittala |
| Rajata | Vaṅga | Kāṁsya |
| Tāmra | - | Varta |
| Loha | - | - |

**Ratna:**

माणिक्यमुक्ताफलविद्रुमाणि ताक्ष्यं च पुष्पं भिदुरञ्च नीलम् ।
गोमेदकञ्चाथ विदूरकञ्च क्रमेण रत्नानि नवग्रहाणाम् ।। (R. R. S. 4/6)

1. Māṇikya 2. Muktāphala 3. Pravāla (vidruma) 4. Tārkṣya (marakata) 5. Puṣparāga 6. Vajra (bhidūra) 7. Nīlama 8. Gomeda and 9. Vaiḍūrya; are the nine ratna that are enlisted.

**Uparatna:**

वैक्रान्तं सूर्यकान्तश्च चन्द्रकान्तो नृपोपलः । पेरोजकञ्च स्फटिकं क्षुद्ररत्नगणो ह्ययम् ।।
(R. T. 23/154)

1. Vaikrānta 2. Sūryakānta 3. Candrakānta 4. Nṛpopala 5. Pairojaka 6. Sphaṭika; are the six uaparatna (kṣudra ratna) that are enlisted.

**MAHĀRASA- Tabular representation:**

The table below shows, the diverse opinion about 'mahārasa' as per different textual references;

| Sl. No. | | R. R. S. 2/1 (8) | R. Hṛ. Tantra 9/4 (8) | Rasārṇava 7/2 (8) | R. P. Su. 5/2 (8) | R. Cū. 10/1 (8) | Go. Saṁ. 2/20 (8) | Rasop. 4/4 (7) | Rasa Paddhati 1/38 (6) | Āy. Pra. 2/347 (1) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Abhraka | + | - | - | + | + | + | - | + | - |
| 2 | Vaikrānta | + | + | - | + | + | + | + | + | - |
| 3 | Mākṣika | + | + | + | + | + | + | + | + | - |
| 4 | Vimala | + | + | + | + | + | + | + | - | - |
| 5 | Śilājatu (Adrija) | + | + | + | + | + | + | + | + | - |
| 6 | Sasyaka (Tuttha) | + | + | + | + | +, +* | + | + | + | - |
| 7 | Capala | + | - | + | - | - | - | + | + | - |
| 8 | Rasaka | + | + | + | + | - | + | - | - | - |
| 9 | Kāntaloha | - | + | - | - | - | - | - | - | - |
| 10 | Hiṅgula | - | + | + | - | - | + | - | - | - |
| 11 | Srotoñjana | - | - | + | - | - | - | - | - | - |
| 12 | Rājāvarta | - | - | - | + | + | - | - | - | - |
| 13 | Pārada | - | - | - | - | - | - | + | - | + |

'+, +*' = Indicates that the author has counted both the synonymous words 'sasyaka' and 'tuttha' as mahārasa.

## UPARASA- Tabular representation:

| Sl. No. | | R. R. S. 3/1 (8) | R. Hṛ. Tantra 9/5 (8) | R. P. Su. 6/1 (8) | Go. Saṁ. 2/29 (8) | R. Cū. 11/1 (8) | Rasārṇava 7/56 (8) | Rasop. 4/5 (7) | R. R. Lakṣmi (5) | R. Paddhati 1/55 (3) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Gandhaka | + | + | + | + | + | + | + | + | + |
| 2 | Gairika | + | + | + | + | + | + | + | + | - |
| 3 | Kāsīsa | + | + | + | + | + | + | + | - | - |
| 4 | Kāṅkṣī (Sphaṭika) | + | + | + | + | + | + | + | + | - |
| 5 | Haratāla | + | + | + | + | + | + | + | + | + |
| 6 | Manaḥśilā | + | + | + | + | + | + | + | + | + |
| 7 | Añjana | + | + | + | + | +* | - | + | - | - |
| 8 | Kaṅkuṣṭha | + | + | + | + | + | + | - | - | - |
| 9 | Rājāvarta | - | - | - | - | - | + | - | - | - |

+* = 'Souvīrāñjana' is counted in place of 'añjana'.

- Āyurveda Prakāśa:

Has quoted two references for 'uparasa' at two different places in his book.

- Rasendrasāra Saṅgraha (1/119) has counted 20 uparasa:

Gandhaka, Haratāla, Manaḥśilā, Kāsīsa, Gairika, Añjana, Vajra, Vaikrānta, Abhraka, Kharpara, Tuttha, Vimala, Varāṭikā, Kāntapāṣāṇa, Hiṅgula, Śaṅkha, Bhūnāga, Ṭaṅkaṇa, Śilājatu and Khaṭikā; are the 20 uparasa enlisted.

- Rasamañjarī (3/1-2) has counted 20 uparasa:

Same 20 uparasa of 'Rasendrasāra Saṅgraha' are enlisted as uparasa with only one change, i.e. in the place of 'Gairika', 'Kaṅkuṣṭha' is added.

- Ānandakanda (1/4-8) has counted 23 uparasa:

First 8 of 'Rasahṛdaya Tantra' + Abhraka, Kharpara, Tuttha, Swarṇa mākṣika, Varāṭikā, Kāntapāṣāṇa, Hiṅgula, Śaṅkha, Bhūnāga, Ṭaṅkaṇa, Śilājatu, Sikatā, Sindūra, Samudraphena, Śambūka; are the 23 uparasa enlisted.

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## Chapter 15
# MAHĀRASA

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## 1. ABHRAKA
### (Mica)

**Introduction:**

Abhraka is the first drug in 'mahārasa group'. It is called as 'Mica' in English. These micas belong to sheet-silicate minerals. The word 'mica' is derived from the Latin term 'micare' which means 'to glitter'.

**Manifestation:**

The mica group of sheet-silicate minerals includes several closely related materials having close to perfect basal cleavage. All are monoclinic, with a tendency towards pseudohexagonal crystals, and are similar in chemical composition. The highly perfect cleavage, which is the most prominent characteristic of mica, is explained by the hexagonal sheet-like arrangement of its atoms.

**Occurrence:**

Mica is widely distributed and occurs in igneous, metamorphic and sedimentary regimes. Large crystals of mica used for various applications are typically mined from granitic pigmentitis.

Until the 19th century, large crystals of mica were quite rare and expensive as a result of the limited supply in Europe. However, their price dramatically dropped when large reserves were found and mined in Africa and South America during the early 19th century.

The largest documented single crystal of mica (phlogopite) was found in Lacey mine, Ontario, Canada; it measured 10x4.3x4.3 meters and weighed about 330 tones. Similar-sized crystals were also found in Karelia, Russia.

India is also a leading producer of mica. The regions of Bihar and Andhra Pradesh are chief sources of mica in India. It is also found in Karnataka, Rajasthan and Madhya Pradesh.

**Physical properties:**

Mica group of sheet-silicate minerals will be fragile, smooth and lustrous to look. Out of many useful varieties, some will be considerably soft and flexible. These sheets are insoluble in water and are bad conductors of heat and electricity.

dr keshav_raj

Depending on the different chemical compositions, the micas are found in different colours. Abhraka in classical references is identified on the basis of its colour. Some of the useful micas along with other useful details are enlisted in this table.

| | Mica | Chemical composition | Chemical identification | Āyurvedic naming |
|---|---|---|---|---|
| 1 | Biotite | $(H, K)_2 (Mg, Fe)_2 (Al, Fe)_2 (SiO_4)_3$ | Black mica or Magnesium Iron mica | Kṛṣṇa abhraka |
| 2 | Lepidolite | $KLi [Al (OHF)_2] Al (SiO_4)_3$ | Lithium or Ruby mica | Pīta abhraka |
| 3 | Muscovite | $H_2 KAl_3 (SiO_4)_3$ | White or Potash mica | Śweta abhraka |
| 4 | Phlogopite | $[HK (MgF)]_3 Mg_3 Al (SiO_4)_3$ | Magnesium or Amber mica | Rakta abhraka |
| 5 | Paragonite | $H_2 Na Al_3 (SiO_4)_3$ | White or Sodium mica | Śweta abhraka |

**Abhraka- synonyms:**

अभ्रकं गगनं भृङ्गमभ्रं खं व्योमनामकम् । वज्रं घनञ्च गिरिजं बहुपत्रमनन्तकम् ।।
आकाशमम्बरं शुभ्रं त्वमलं गरजध्वजम् । मेघाख्यमन्तरिक्षञ्च तदेव परिकीर्त्तितम् ।।

(R. T. 10/1-2)

Abhraka, gagana, bhṛṅga, abhra, kha, vyoma, vajra, ghana, girija, bahupatra, anantaka, ākāśa, ambara, śubhra, amala, garajadhwaja, meghā and antarikṣa; all these names are used as synonyms for 'abhraka' in classics.

**Abhraka- brief history:**

The first reference for 'abhraka' can be traced from 'Kouṭilya Arthaśāstra' belonging to 4th century BC. The name of 'vajrābhraka' is found in this book in the context of 'artificial gold preparation'. Its reference is also found in another book of 4th century BC named 'Nyāyadarśana' written by 'Ācārya Goutama'.

In 'Amarakoṣa', which belongs to 6th century, the drug has been mentioned by the name 'girijāmala' (one should note that, in the texts of Rasaśāstra, abhraka is named as 'gourībīja') and is specified for 'dhātuvāda' purpose.

The therapeutic utility (dehavāda), abhraka is mentioned for the first time in 'Aṣṭāṅga Hṛdaya'. It is used as an ingredient in 'Kāsīsādi taila' meant for external use in 'Arśa roga cikitsā'.

**Abhraka bheda:**

अभ्रं सितारुणश्यामपीतवर्णविभेदतः । चतुर्विधं समाख्यातं कृष्णं तत्र गदापहम् ।। (R. T. 10/3)

1. Śwetābhra 2. Raktābhra (aruṇābhra) 3. Kṛṣṇābhra (śyāmābhra) and 4. Pītābhra; are the four varieties of abhraka identified. Out of all these 'kṛṣṇābhra' is the one, which is therapeutically used.

**Kṛṣṇābhra- 4 varieties:**

पिनाकनागमण्डूकवज्राह्वयविभेदतः । चतुर्विधन्तु कृष्णाभ्रं मतं रसविशारदैः ॥ (R. T. 10/4)

1. **Pināka** kṛṣṇābhraka 2. **Nāga** kṛṣṇābhraka 3. **Maṇḍūka** kṛṣṇābhraka and 4. **Vajra** kṛṣṇābhraka; are the four varieties of 'kṛṣṇābhraka' categorized depending on its response towards heat.

Note: According to some authors, each of these varieties will be of four types again depending on the colour (śweta, rakta, kṛṣṇa, pīta) specified in the earlier verse. In that case, there will be 16 types of abhraka. However, the one that is therapeutically useful is 'vajra-kṛṣṇābhraka' or 'kṛṣṇa-vajrābhraka'.

**Abhraka categorization:**

| ABHRAKA | | | |
|---|---|---|---|
| **Pinākābhraka** | **Nāgābhraka** | **Maṇḍūkābhraka** | **Vajrābhraka** |
| Śweta<br>Rakta<br>Kṛṣṇa<br>Pīta | Śweta<br>Rakta<br>Kṛṣṇa<br>Pīta | Śweta<br>Rakta<br>Kṛṣṇa<br>Pīta | Śweta<br>Rakta<br>Kṛṣṇa<br>Pīta |

**1. Pinākābhraka- lakṣaṇa:**

अग्नौ सन्तापितं यत्तु दलानि परिमुञ्चति । रसतन्त्ररहस्यज्ञैस्तत् पिनाकं प्रकीर्तितम् ॥

(R. T. 10/5)

The abhraka variety that separates into different layers when exposed to fire is identified as 'pināka variety of kṛṣṇābhraka'. This variety of kṛṣṇābhraka is therapeutically hazardous. If administered, it causes severe constipation that may lead to death. It causes any of the mahāroga such as kuṣṭha, vātavyādhi, aśmarī, prameha, udararoga, bhagandara, arśa and grahaṇī roga.

पिनाकाभ्रं मलं रुद्ध्वा कुरुते मरणं ध्रुवम् । कुष्ठादिकान्महारोगान् जनयत्यपि निश्चितम् ॥

(R. T. 10/6)

**2. Nāgākābhraka- lakṣaṇa:**

पावकोत्तापित्तं यत्तु फूत्कारं परिमुञ्चति । क्रुद्धाहिश्वासवच्छीघ्रं नागाभ्रं तदिहोच्यते ॥

(R. T. 10/7)

The abhraka variety that produces appreciable hissing sounds like snake when exposed to fire is identified as 'nāga variety of kṛṣṇābhraka'. This variety of kṛṣṇābhraka is also therapeutically hazardous. If administered, it causes severe bhagandara roga. It causes maṇḍala kuṣṭha roga or mahā kuṣṭha roga.

नागाभ्रं सेवितं कुर्यान्महाघोरं भगन्दरम् । मण्डलं वा महाकुष्ठं तद्द्वयं वा न संशयः ॥
(R. T. 10/8)

### 3. Maṇḍūkābhraka- lakṣaṇa:

अग्नौ सन्तापितं यत्तु भेकवत्कुरुते रवम् । उत्प्लुत्योत्प्लुत्य च पतेन्मण्डूकं तदिहोच्यते ॥
(R. T. 10/9)

The abhraka variety that produces appreciable sound like that of a frog and jumps out of fire when exposed to fire is identified as 'maṇḍūka variety of kṛṣṇābhraka'. This variety of kṛṣṇābhraka is also therapeutically unfit. If administered for long, it causes aśmarī roga that may need surgery.

मण्डूकसंज्ञकं त्वभ्रं सततं परिशीलितम् । अश्मरीं जनयत्याशु शस्त्रसाध्यमसंशयम् ॥
(R. T. 10/10)

### 4. Vajrābhraka- lakṣaṇa:

पावकोत्तापित्तं यत्तु विकृतिं नैव गच्छति । तिष्ठत्यग्नौ भिदुरवत् वज्राभ्रं तत्प्रकीर्तितम् ॥
(R. T. 10/11)

The abhraka variety that neither exhibits any physical changes nor produces any sound when exposed to fire is identified as 'vajra variety of kṛṣṇābhraka'.

This variety is therapeutically the best variety out of all the remaining. Its judicious use will cure all the mahāroga such as kuṣṭha, vātavyādhi, aśmarī, prameha, udararoga, bhagandara, arśa and grahaṇī roga. Its prolonged use will make the body physically fit and radiant. It effectively fights aging and makes the person look young.

सर्वश्रेष्ठं तु वज्राभं महाव्याधिहरं परम् । देहसिद्धिकरञ्चापि जरावैरूप्यनाशनम् ॥ (R. T. 10/12)

### Śreṣṭha abhraka- properties:

नीलाञ्जनोपमं स्निग्धं भारपूर्णं महोज्ज्वलम् । निर्मोच्यपत्रं मृदुलं त्वभ्रं श्रेष्ठमिहोच्यते ॥
(R. T. 10/13)

The abhraka, which is black like 'nīlāñjana' in appearance, which is snigdha, heavy and bright with separable layers and which is soft to touch; is considered the best variety of abhraka. All these properties are seen in 'kṛṣṇa vajrābhraka'.

- Another reference:

स्निग्धं पृथुदलं वर्णसंयुक्तं भारतोऽधिकम् । सुखनिर्मोच्यपत्रं च तदभ्रं शस्तमीरितम् ॥
(R. R. S. 2/11)

**Abhraka quality with respect to its availability:**

अभ्रकं हिमशैलोत्थमुत्तमं परिकीर्तितम् । मध्यमं पुर्वशैलोत्थं त्वधमं दक्षिणाद्रिजम् ।। (R. T. 10/14)

Abhraka obtained from the ores of 'Himalayan range' is considered to have best therapeutic values. The one obtained from the mountains of eastern India is of medium qualities; and the one obtained from mountains of southern India is the low quality abhraka, which is unfit for any therapeutic use.

**Abhraka- conventional extraction method:**

गजप्रमाणं पुरुषप्रमाणं वा खानयेद्वै खनिमामयज्ञः ।
ततो गुणाढ्यं खलु भारपूर्णं समाहरेदभ्रकमञ्जनाभम् ।। (R. T. 10/15)

A pit of 'one gaja' length or roughly of around 'four hasta' (82 inches) length is dug in the place where best variety of abhraka is available. From there the abhraka, which is black like 'nīlāñjana' in appearance, which is snigdha, heavy and bright with separable layers and which is soft to touch; is collected. Abhraka collected only from this depth will possess all the therapeutic values.

**Aśuddha abhraka- doṣa:**

बाधां विदध्याद्विविधां शरीरे हृत्पार्श्वपीडां तनुते नितान्तम् ।
शोफं क्षयं पाण्डुगदञ्च कुष्ठं त्वशोधिताभ्रं खलु मारितं यत् ।।
धान्याभ्रकरणे चैव मारणे सत्त्वपातने । रसतन्त्रविशेषज्ञः शुद्धमभ्रं नियोजयेत् ।। (R. T. 10/16-17)

The administration of 'aśuddha abhraka' or improperly purified abhraka leads to many health hazards. It causes 'hṛtpārśwa pīḍā' (pain in the cardiac region and flanks), śopha (oedema), kṣaya (tuberculosis), pāṇḍu roga (anaemia) and kuṣṭha (skin diseases). Therefore, to prepare dhānyābhraka, to incinerate or to extract sattwa from abhraka, only 'śuddha abhraka' has to be used.

**Abhraka śodhana:**

प्रतप्तं सप्तवाराणि निक्षिप्तं काञ्जिकेऽभ्रकम् । निर्दोषं जायते नूनं प्रक्षिप्तं वाऽपि गोजले ।।
त्रिफलाक्वथिते चापि गवां दुग्धे विशेषतः । (R. R. S. 2/16-17)

The thin sheets of 'kṛṣṇa vajrābhraka' are held carefully with 'sandaṁśa yantra', heated red-hot over the glowing charcoal and dipped in any of the following liquids; kāñjī, gomūtra, triphalā kwātha and godugdha. This process of heating and dipping is repeated for 7 times to obtain 'śuddha abhraka'

Note:

- For first time heating of the abhraka, it can be firmly held with 'sandaṁśa yantra' (holder), heated red-hot and dipped in the specified liquid. However, once done so, it withers into layers/smaller pieces. Therefore, from second time onwards it can be heated by placing its pieces on a thin tin sheet placed over fire.

- It is better to take fresh liquid (kāñjī, gomūtra, triphalā kwātha and godugdha) each time for dipping the red-hot drug. With each dipping, the physical impurities (like sand, mud etc) present in the drug will sink down in the liquid.

**Abhraka śodhana- another reference:**

अभ्रकं  वह्निसन्तप्तं सप्तवारं निषेचितम् । गोदुग्धे वा वराक्वाथे शुद्धिमायात्यनुत्तमाम् ।।

(R. T. 10/20)

The 'kṛṣṇa vajrābhraka' is heated red-hot and dipped in 'godugdha' or 'triphalā kaṣāya'. This process of heating and dipping is repeated for 7 times to obtain 'śuddha abhraka'.

**Dhānyābhraka- nirmāṇa:**

पादांशशालिसंयुक्तमभ्रकं  कम्बलोदरे । त्रिरात्रं स्थापयेन्नीरे तत् क्लिन्नं मर्दयेद् दृढ़म् ।।
कम्बलाद्गलितं श्लक्ष्णं बालुकारहितञ्च यत् । तद्धान्याभ्रमिति प्रोक्तमभ्रमारणसिद्धये ।।

(R. Sā. San. 1/154)

1. Śuddha abhraka- 1 part and 2. Śāli (dhānya; rice grains with husk intact)- quarter part; both these are firmly tied like a poṭṭalī in a jute cloth or a piece of rug with a strong thread. It is now kept soaked in water (kāñjī as per some other references) for three nights. Later, the poṭṭalī is rigorously rubbed with both hands in the same water.

By doing so, because of the friction between the pointed ends of the śāli, the sheets of abhraka break into smaller uniform pieces. All these pieces of abhraka gradually trickle down into the water through the jute cloth while rubbing and will be collected at the base of the vessel. Later the water is decanted and the abhraka pieces at the base are dried and used as 'dhānyābhraka' for 'abhraka māraṇa'.

Note:

- Dhānyābhaka like uniform pieces of the drug cannot be obtained by triturating the drug in khalva yantra.
- The jute cloth containing dhānya (śāli) and abhraka is usually kept soaked in water or kāñjī for 3 days to assist better dhānyābhraka nirmāṇa.

**Abhraka māraṇa- puṭa saṅkhyā:**

विशत्यादिः शतान्तस्तु पुटौ रोगनिवृत्तये । शतादिस्तु सहस्रान्तः प्रशस्तश्च रसायने ।। (R. T. 10/29)

To obtain 'abhraka bhasma', which is effective enough in curing all the ailments in which it is indicated, the 'śuddha abhraka' has to be subjected to minimum of 10 or maximum of 100 puṭa.

However, to obtain abhraka bhasma fit for 'rasāyana' purposes, the 'śuddha abhraka' should be subjected to minimum of 100 or maximum of 1000 puṭa.

**Abhraka māraṇa- 1st method:**

धान्याभ्रं कासमर्दस्य रसेन परिमर्दितम् । पुटितं दशवारेण म्रियते नात्र संशयः ।। (R. R. S. 2/22)

Dhānyābhraka is taken in a clean khalva yantra and subjected for thorough trituration with 'kāsamarda swarasa or kwātha'. Later the 'cakrikās' of desired size and shape are prepared and dried under sun. These dry cakrikās are enclosed in a 'śarāva sampuṭa' and subjected for one 'gajapuṭa'.

When cool on its own, the drug material from the sampuṭa is collected, triturated again with 'kāsamarda swarasa or kwātha', cakrikās are prepared, enclosed in śarāva sampuṭa and subjected for another gajapuṭa. Like this, the drug is exposed to 10 such gajapuṭa to obtain appropriately prepared brick red coloured abhraka bhasma.

**Abhraka māraṇa- 2nd method:**

तद्वन्मुस्तारसेनापि तण्डुलीयरसेन च । (R. R. S. 2/22)

In the similar way as said in the first method, 'dhānyābhraka' is subjected for thorough trituration with 'mustā kwātha' or 'taṇḍulīya swarasa', 'cakrikās' are prepared, dried, enclosed in a 'śarāva sampuṭa' and subjected for one 'gajapuṭa'.

All this process is repeated for 10 times to subject the drug to 10 gajapuṭa to obtain appropriately prepared brick red coloured abhraka bhasma.

**Abhraka māraṇa- 3rd method:**

गन्धर्वपत्रतोयेन गुडेन सह भावितम् । ऊर्ध्वाधो वटपत्राणि निश्चन्द्रं त्रिपुटैः खगम् ।।
(R. R. S. 2/43)

Dhānyābhraka is taken in a clean khalva yantra along with equal quantity of 'guḍa' (jaggary) and subjected for thorough trituration with 'eraṇḍa patra swarasa'. Later the 'cakrikās' of desired size and shape are prepared, dried under sun, enclosed in a 'śarāva sampuṭa' and subjected for one 'gajapuṭa'.

All this process is repeated for 3 times to subject the drug to 3 gajapuṭa to obtain appropriately prepared lustre free abhraka bhasma.

### Abhraka māraṇa- 4th method:

धान्याभ्रं पञ्चवारं प्रथममिह पुटेन्मुस्तकक्वाथयोगात्
रम्भानीरेण तद्वत्तदनु च सलिलैस्तण्डुलीयप्रसूतैः ।
भृङ्गोत्थेनापि वारा तदनु खलु वरानीरपूरेण पिष्ट्वा
दत्त्वा गन्धश्च तुल्यं सकृदिह पुटितो वारिदो याति मृत्युम् ॥ (R. T. 10/38)

Dhānyābhraka is triturated for five times with each of 'mustā swarasa', 'kadalī kanda swarasa', 'taṇḍulīya swarasa', 'bhṛṅgarāja swarasa' and 'triphalā kwātha' and exposed to one 'gajapuṭa' each time. Like this, it will be 25 gajapuṭa in total. At the end the bhasma is added with equal quantity of 'śuddha gandhaka' and subjected to another gajapuṭa (26th) to obtain appropriately prepared 'abhraka bhasma'.

### Abhraka bhasma (mṛtābhra)- lakṣaṇa:

निश्चन्द्रञ्चारुणं स्वच्छं सुसूक्ष्मं स्पर्शकोमलम् । अभ्रं मृतं विजानीयाद्रसतन्त्रविचक्षणः ॥
(R. T. 10/55)

Properly prepared 'abhraka bhasma' should be; 1. Lustre free (niścandra); 2. Reddish in colour (aruṇa varṇa); 3. Clean 4. Micro fine powder; and 5. Very soft to touch.

All these symptoms must be seen in a properly prepared abhraka bhasma. If the bhasma lacks any of these properties, it should not be used; because such bhasma will be hazardous to the body.

Note: In general every 'bhasma' should fulfil all the criteria of 'bhasma parīkṣa'. They are vārītara, rekhāpūrṇa, niścandra, ślakṣaṇa, sūkṣma, mṛdu, niswādu, nirdhūma, apunarbhava, niruttha, laghu and dantāgre kacakacābhāva rahita.

### Abhraka bhasma- lohitikaraṇa:

गाङ्गेरुकी भद्रमुस्ता वटक्षीरन्तथैव च । वटमूलजलं वापि हरिद्राया द्रवस्तथा ॥
समङ्गाक्वथितञ्चैव घनमेभिः सुपेषयेत् । पुटद्वयं त्रयं वापि वितरेद्भिषजां वरः ॥
निश्चन्द्रिकञ्च मृदुलं रक्तोत्पलसमप्रभम् । गगनस्य भवेद्भस्म ततः कार्येषु योजयेत् ॥
(R. T. 10/65-67)

After incinerating 'abhraka' with 'abhraka māraṇa dravya', if the colour of the bhasma does not become red (like that of japākusuma), then, the bhasma has to be triturated with any of the following liquids; 'gaṅgeruka (Grewia tenax) kwātha', 'mustā kwātha', 'vaṭa-kṣīra', 'vaṭa mūla swarasa', 'haridrā swarasa or kwātha', 'mañjiṣṭhā kwātha' or 'lajjālū kwātha' and later subjected for 2 to 3 gajapuṭa. By doing so, the desired red colour may be obtained in the abhraka bhasma. Concurrently, the bhasma becomes lustre free, smooth and soft to touch.

**Amṛtikaraṇa:**

लोहादीनां मृतानां वै शिष्टदोषापनुत्तये । क्रियते यस्तु संस्कार अमृतीकरणं मतम् ।। (R. T. 2/58)

The special pharmaceutical procedures (saṁskāra) carried out to eliminate the remaining doṣas of any 'dhātu bhasma' (incinerated metal) is called as 'amṛtīkaraṇa'.

अरुणभस्मनंस्तु पुनरमृतीकरणेन गुणवृद्धिर्वर्णहानिश्च भवति । (Āy. Pra. 2/135)

Amṛtīkaraṇa enhances the properties (guṇa vṛddhi) of the bhasma and causes depletion in its colour.

**Abhraka bhasma amṛtikaraṇa- 1st method:**

मारितं त्वतियत्नेन दशभागिकमभ्रकम् । त्रिफ्लाक्वथितं चैव नवं षोडशभागिकम् ।।
नागभागिकमुस्राज्य दत्वा लोहस्य भाजने । पाचनाज्जायते रम्यममृतीकरणम् वरम् ।।
(R. T. 10/68-69)

1. Abhraka bhasma- 10 parts; 2. Triphalā kaṣāya- 16 parts; and 3. Goghṛta- 8 parts; all the drugs are taken in an iron vessel (kaḍhāhī) in specified ratio. The vessel is placed over mild fire and cooked with frequent stirring until all the liquid part in the mixture is lost.

Later the dry powder of abhraka bhasma is collected and stored in suitable airtight container. This is 'amṛtīkaraṇa' of abhraka bhasma.

**Abhraka bhasma amṛtikaraṇa- 2nd method:**

कन्याम्बुमेघगव्याज्यं कलादिक् तपनांशकम् । पचेन्मन्दानलेनैतदमृतीकरणम् वरम् ।।
(R. T. 10/70)

1. Abhraka bhasma (megha)- 12 parts; 2. Kumārī swarasa- 16 parts; and 3. Goghṛta- 12 parts; all the drugs are taken in an iron vessel (kaḍhāhī) in specified ratio. The vessel is placed over mild fire and cooked with frequent stirring until all the liquid part in the mixture is lost.

Later the dry powder of abhraka bhasma is collected and stored in suitable airtight container. This is 'amṛtīkaraṇa' of abhraka bhasma.

**Abhraka bhasma amṛtikaraṇa- 3rd method:**

मृताभ्रसंमितं गव्यमाज्यं दत्वाभ्रकं पचेत् । अमृतीकृतमेवन्तु घनं कार्येषु योजयेत् ।।
(R. T. 10/71)

1. Abhraka bhasma- 1 part; 2. Goghṛta- 1 part; both the drugs are taken in an

iron vessel (kaḍhāhī) in specified ratio. The vessel is placed over mild fire and cooked with frequent stirring until all the liquid part in the mixture is lost.

Later the dry powder of abhraka bhasma is collected and stored in suitable airtight container. This is 'amṛtīkaraṇa' of abhraka bhasma.

### Abhraka bhasma- properties:

अभ्रं स्निग्धं परमशिशिरं स्वादु चायुष्यमग्र्यं केश्यं वर्ण्यं रुचिकरमलं दीपनं चातिबल्यम् ।
नेत्र्यं मेधां जनयतितरां स्तन्यसंवर्द्धनञ्च क्षेत्रे स्थैर्य्यं वितरति परं दीपनं पुष्पकेतोः ॥
क्षिप्रं घोरां दलयति महारोगसंघातभीतिं स्वान्ते प्रीतिं जनयति परं नर्महासे च यूनः ।
देहे शक्तिं वितरतितरां बह्वपत्यप्रदात्री कार्यालस्यं हरति सुतरामभ्रकं सेव्यमानम् ॥
(R. T. 10/72-73)

Appropriately prepared 'abhraka bhasma' will be 'snigdha' with śīta-vīrya and madhura rasa. Its judicious use provides healthy and long life. This medicine is good for hair (keśya), provides good body complexion (varṇya), appetizer (rucikara), laxative and strengthening. It is good for eyes (netrya), improves intellect (medhā) and encourages lactation.

It provides stability and firmness in the body and improves sexual desire. It protects the person from all the 'mahāroga' and brings calmness to the mind. It improves the reproductive capacity of humans. It keeps the person active by droving off the laziness.

### Abhraka bhasma- dosage and adjuvant:

The dosage of properly prepared abhraka bhasma is from one to two rattī (125 to 250 mgs) administered twice or thrice daily along with honey, ghee, butter or any other suitable adjuvant.

### Aśuddha abhraka bhasma- hazards:

पीड़ा विधत्ते विविधां नराणां कुष्ठं क्षयं पाण्डुगदं च शोथम् ।
हृत्पार्श्वपीडां च करोत्यशुद्धमभ्रं हि तद्वद्गुरुवह्निहृत्स्यात् ॥
(Āy. Pra. 2/103)

Abhraka bhasma prepared from 'aśuddha abhraka' if administered, it causes kuṣṭha roga (skin diseases), kṣaya roga (emaciation), pāṇḍu roga (anaemia), śotha (oedema) and pain in cardiac region and flanks. It causes loss of appetite and is guru for digestion.

### Apakwa abhraka bhasma- hazards:

यथाविषं यथावज्रं शस्त्राग्निः प्राणहा भवेत् । भक्षितं चन्द्रिकायुक्तमभ्रकं तादृशं गुणैः ॥
(R. P. Su. 5/95)

The improperly prepared 'abhraka bhasma' is as lethal as viṣa (poison), vajr (diamond), śastra (sharp weapon) or agni (fire). Its consumption causes loss of appetite and induces 'prameha roga'. It causes 'chidrodara' and kills the person.

मेवितं चन्द्रसंयुक्तं मेहं मन्दानलं चरेत् । (R. P. Su. 5/93)

**Sattva- significance:**

योगेषूपरसादीनां योगे सत्त्वयोजनम् । गुणोत्तरं भवेद्यस्मात्तस्मात्सत्त्वं विशिष्यते ।। (R. T. 10/90)

Instead of using the rasa dravya in their 'incinerated form' or in the form of different 'compound formulations', it is always better to use the 'incinerated sattva' of these rasa dravya. Because the 'sattva' are always more efficacious than the remaining forms of the drug.

**Abhraka sattvapātana:**

पादांशटङ्कणोपेतं मुसलीरसमर्दितम् । रुन्ध्यात्कोष्ठ्यां दृढं ध्मातं सत्त्वरूपं भवेद्घनम् ।।
(R. R. S. 2/26)

One part of 'śuddha abhraka' is added with 1/4th part of 'śuddha ṭaṅkaṇa' and triturated thoroughly with 'muśalī swarasa' to prepare 'cakrikās' of desired size and shape. Later they are dried under sun, taken in a crucible and subjected for proper heat in 'koṣṭhī yantra'. By doing so, the aluminium like sattva is extracted.

Note: The sattva obtained from 'abhraka' should be pure 'aluminium', but this does not happen always because of imperfect abhraka samples.

**Abhraka sattva- piṇḍikaraṇa:**

मित्रपञ्चकसंयुक्तं खसत्त्वं चूर्णसन्निभम् । मूषायां विनिधायाथ प्रधमेत्कोकिलानले ।।
इत्थं तीक्ष्णतरं ध्मातमेकतां याति कांस्यवत् । पिण्डीभूतं ततः सत्त्वं शोधनार्थं प्रयोजयेत् ।।
(R. T. 10/101-102)

The 'abhraka sattva' is added with drugs of 'mitra-pañcaka', taken in a crucible of suitable size and subjected for heat using charcoal in oven. By doing so, the bhasma accumulates at one place like that of kāṁsya. This process is called as abhraka-sattva piṇḍīkaraṇa.

Note: The term 'piṇḍīkaraṇa' means accumulation.

**Abhraka sattva śodhana:**

त्रिफलासलिले वापि वटमूलकषायतः । अम्लेन काञ्जिकैर्वापि खसत्त्वं शोधयेद्भिषक् ।।
(R. T. 10/103)

Abhraka sattva is heated red-hot and dipped for seven times in 'triphalā kwātha' or 'vaṭa mūla kwātha' or 'any amla-dravya' or 'kāñjī'. Each time the liquid taken should be fresh. By doing so, the abhraka sattva is purified.

### Abhraka sattva māraṇa- 1st method:

विशोधितं व्योमसत्त्वं तदर्धं सूतगन्धकम् । निक्षिप्य मर्दयेत्खल्वे काचकूपीगतं ततः ।।
पचेत्तु बालुकायन्त्रे विधानज्ञो भिषग्वरः । इत्थं नातिचिरादेव खसत्त्वं याति पञ्चताम् ।।
(R. T. 10/108-109)

One part of 'abhraka sattva', half part of 'samagandhaka kajjalī' are taken in a clean khalva yantra and triturated. The mixture is taken in a 'mṛtkapaṭita kācakūpī' (beer bottle covered with seven layers of mud smeared cloth), placed in vālukā yantra and subjected for intense heat to obtain bhasma of abhraka sattva.

### Abhraka sattva māraṇa- 2nd method:

द्वौ भागौ घनसत्त्वस्य भागश्च रसगन्धयोः । श्लक्ष्णपिष्टं ततः कृत्वा सप्तवारं प्रयत्नतः ।।
गोमयाग्नौ पचेत्प्राज्ञः खसत्त्वस्य मृतिर्भवेत् । एवं मृतं व्योमसत्त्वं वीतशङ्कः प्रयोजयेत् ।।
(R. T. 10/110-111)

Two parts of 'abhraka sattva', one part of 'samagandhaka kajjalī' are taken in a clean khalva yantra and triturated. The mixture is enclosed in a 'śarāva sampuṭa' and subjected for 'puṭa' with dry cow dung cakes. Like this, seven puṭa are applied to obtain properly prepared abhraka sattva bhasma. This can be used for all therapeutic purposes with no inhibitions.

### Abhraka sattva bhasma- properties:

अभ्रसत्त्वं सुशिशिरं मधुरं रुचिरं परम् । सुस्निग्धं केश्यमायुष्यं त्रिदोषघ्नं रसायनम् ।।
(R. T. 10/112)

Abhraka sattva bhasma possesses śīta-vīrya and madhura rasa. It is appetizer, snigdha, good for hair growth and nourishment, āyu-vardhaka, tridoṣa-śāmaka and a good rasāyana.

Its judicious use makes the person so virile that he/she becomes capable enough to satisfy a sexually strong partner and can initiate healthy conception. This medicine can bring in radiance in the face of the person and makes the person lead a healthy life of 100 years. There is no safer and better medicine than this for body nourishment, to cure impotency, to arrest aging process and for tridoṣa-śamana (R. T. 10/113-115).

### Abhraka sattva- apathya:

करीरं कारवेल्लञ्च कर्कटीं कोलमम्लकम् । तैलं क्षारञ्च वृन्ताकं नाश्नीयादभ्रसेवकः ।।
(R. T. 10/116)

During administration of abhraka sattva, one should avoid intake of, karīra (Capparis decidua), kāravellaka (bitter gourd), karkaṭī (Pistacia integerrima), amla kola (amla-badara), more oily foods, kṣāra (alkalies) and brinjol.

**Abhraka- few compound formulations:**

1. Ārogyavardhinī vaṭī
2. Gagana parpaṭī
3. Pañcāmṛta parpaṭī
4. Prabhākara vaṭī
5. Yogendra rasa
6. Candrāmṛta rasa
7. Saubhāgyaśuṇṭhī pāka
8. Vasantakusmākara rasa
9. Bṛhatvātacintāmaṇi rasa
10. Śwāsakāsacintāmaṇi rasa

## 2. VAIKRĀNTA

**Introduction:**

Vaikrānta is the second mineral drug in 'mahārasa group'. It is called as 'Tourmaline' in English. Tourmaline is a crystal borosilicate mineral compounded with elements such as aluminium, iron, magnesium, sodium, lithium, or potassium. Chemically it is identified as Mg, Mn, Fe, Ca, Na, K, Li, H, F, $Al_3$, $B_2$, $SiO_4$, $O_2$.

Tourmaline is also classified as a semi-precious stone. This comes in a wide variety of colors. The name 'tourmaline' comes from the 'Sinhalese' word "Thuramali" or "Thoramalli", which is applied to different gemstones found in Sri Lanka.

Tourmaline belongs to the trigonal crystal system and occurs as long, slender to thick prismatic and columnar crystals that are usually triangular in cross-section. The style of termination at the ends of crystals is asymmetrical, called hemimorphism. Small slender prismatic crystals are common in a fine-grained granite called 'aplite', often forming radial daisy-like patterns.

Tourmaline is distinguished by its three-sided prisms; no other common mineral has three sides. Prism's faces often have heavy vertical striations that produce a rounded triangular effect.

Tourmaline has a variety of colors. Usually, iron-rich tourmalines are black to bluish-black to deep brown, while magnesium-rich varieties are brown to yellow, and lithium-rich tourmalines are almost any color—blue, green, red, yellow, pink, etc. Rarely, it is colorless.

Bi-colored and multi-coloured crystals are common, reflecting variations of fluid chemistry during crystallization. Crystals may be green at one end and pink at the other, or green on the outside and pink inside; this type is called 'watermelon tourmaline'. Some forms of tourmaline are dichroic, which change color when viewed from different directions.

**Occurrence:**

Its ores are available in South Africa, Canada, Peru, Mexico, Thailand, Norway, Germany and UK. In India, it is found in Rajasthan and Gujarat.

Note: Some compare 'vaikrānta' with 'Fluorite or Fluospar', which is a halide mineral, composed of calcium fluoride, $CaF_2$.

**Properties:**

| | |
|---|---|
| Chemical name | Tourmaline |
| Chemical composition | Mg, Mn, Fe, Ca, Na, K, Li, H, F, $Al_3$, $B_2$, $SiO_4$, $O_2$. |
| Hardness | 4 on Moh's scale |
| Specific gravity | 3.18 |
| Refractive index | 1.43 |
| Solubility | Insoluble in water |
| Heat exposure | On heating it glitters and with high temperature it melts |
| Substitution | It was substituted for diamond in ancient times |

**Vaikrānta- synonyms:**

वैक्रान्तञ्चैव विक्रान्तं वैक्रान्तं जीर्णवज्रकम् । कुवज्रं क्षुद्रकुलिश चूर्णवज्रञ्च तन्मतम् ॥
(R. T. 23/155)

Vikrānta, vaikrānta, jīrṇavajraka, kuvajra, kṣudrakuliśa and cūrṇa-vajraka; all these are the synonymous words used in the classics for the drug 'vaikrānta'.

**Vaikrānta- brief history:**

First reference of the drug 'vaikrānta' can be traced from 'Kouṭilya Arthaśāstra' belonging to 4th century BC. It is mentioned as 'vaikṛntaka dhātu' in this book in 33rd chapter along with other six metals. In later books starting from 'Rasahṛdaya Tantra', it has been classified under 'mahārasa varga' and 'ratna varga'.

**Vaikrānta- etymology:**

वज्रवत् सर्वरोगाणां हरणाय यतस्त्विदम् । धत्ते विक्रान्तिमतुलां वैक्रान्तं कथ्यते ततः ॥
(R. T. 23/156)

When used judiciously for internal administration in appropriate dosage form the 'vaikrānta' can cure many diseases like that of 'vajra' (diamond). Therefore, this drug is called by the name 'vaikrānta'.

वज्रवत् सर्वरोगहरणायातुलां विक्रान्तिं धत्ते यतस्तस्मात् वैक्रान्तमिति निर्वचनम् ।।

- Other opinions:

विकृन्तयति लोहानि तेन वैक्रान्तकः स्मृतः । (R. R. S. 2/60)

The one, which causes 'vikṛti' (damage) to loha (other metals), is known as 'vaikrānta'. When 'vaikrānta' is rubbed on the surface of other metals, it leaves lines and scratches; and is capable of cutting thin sheets of other metals.

विकृन्तयति रोगाणि इति वैक्रान्तः ।

The judicious administration of 'vaikrānta' in appropriate form can destroy (cure) the diseases in the body. Therefore, it is called as 'vaikrānta'.

- Another opinion:

वैकृन्तीतीरसम्भूतो रसो वैक्रान्तको स्मृतः ।

Since it was obtained on the banks of 'vikṛntī' river in olden days, it was named as 'vaikrānta'.

**Vaikrānta- grāhya swarūpa and bheda:**

अष्टास्रमष्टफलकं सितपीतासितारुणम् । मसृणं गुरु षट्कोणं वैक्रान्तं जात्यमुच्यते ।।
श्वेतो नीलस्तथा रक्तः पीतः पारावतप्रभः । तार्क्ष्याभः कर्बुरः कृष्णो वर्णतश्चाष्टधा हि सः ।।

(R. T. 23/157-158)

The vaikrānta, which possesses eight edges (asra) and eight surfaces (phalaka), which comes white (sita), yellow (pīta), black (asita) and coffee (aruṇa) colours, which is soft to touch, heavy, or which has six angles and six surfaces; such a sample of 'vaikrānta' is considered fit for pharmaceutical use.

**Types:**

Depending on the colour, 'vaikrānta' is categorized into '8 types': 1. Śweta vaikrānta 2. Nīla vaikrānta 3. Rakta vaikrānta 4. Pīta vaikrānta 5. Pārāvataprabha vaikrānta 6. Tārkṣyābha vaikrānta (emerald colour) 7. Karbura vaikrānta (blackish ash colour) and 8. Kṛṣṇa vaikrānta.

- Another reference:

अष्टास्रश्चाष्टफलकः षट्कोणो मसृणो गुरुः । शुद्धमिश्रितवर्णैश्च युक्तो वैक्रान्त उच्यते ।।
श्वेतो रक्तश्च पीतश्च नीलः पारावतच्छविः । श्यामलः कृष्णवर्णश्च कर्बुरश्चाष्टधा हि सः ।।

(R. R. S. 2/52-53)

The vaikrānta, which possesses eight edges (asra), eight surfaces (phalaka) and 6 angles; which is smooth and heavy with uniformly mixed colours; such a sample of 'vaikrānta' is considered fit for pharmaceutical use.

Types:
Depending on the colour, 'vaikrānta' is categorized into '7 types': 1. Śweta vaikrānta 2. Rakta vaikrānta 3. Pīta vaikrānta 4. Nīla vaikrānta 5. Pārāvataprabha vaikrānta 6. Nīlābha kṛṣṇa vaikrānta and 7. Karbura vaikrānta (blackish ash colour);

**Vaikrānta śodhana- necessity:**

अशुद्धौ वज्रवैक्रान्तौ किलासं दाहसन्ततिम् । पार्श्वपीडां तथा पाण्डुं कुरुतस्तौ विशोधयेत् ।।
(Āy. Pra. 5/168)

Administration of 'aśuddha vajra or vaikrānta bhasma' causes diseases such as kilāsa roga, dāha (burning sensation in the body), pārśvapīḍā (pain in the flanks) and pāṇḍu roga (anaemia). Therefore, 'vajra' or 'vaikrānta' has to be properly purified before they are incinerated and administered.

**Vaikrānta śodhana- 1st method:**

वैक्रान्तं पोट्टलीसंस्थं कदलीकन्दजद्रवेः । दोलायन्त्रे परिस्विन्नं यामैकेन विशुद्ध्यति ।।
(R. T. 23/162)

The roughly pounded 'aśuddha vaikrānta' is tied in a 'poṭṭalī', hung in 'dolāyantra' and subjected for 3 hours (one yāma) of 'swedana' by keeping 'kadalī kanda swarasa' as liquid media. Later the drug is washed, dried and stored in airtight container as 'śuddha vaikrānta' for further pharmaceutical use.

**Vaikrānta śodhana- 2nd method:**

वैक्रान्तं सपटुक्षारः कुलत्थक्वाथयोगतः । दोलायन्त्रे परिस्विन्नः शुद्धिमाप्नोति यामतः ।।
(R. T. 23/161)

The roughly pounded 'aśuddha vaikrānta' is tied in a 'poṭṭalī' along with equal quantities of 'saindhava lavaṇa' and 'yavakṣāra'. It is hung in 'dolāyantra' and subjected for 3 hours (one yāma) of 'swedana' by keeping 'kulattha kwātha' as liquid media. Later the drug is washed, dried and stored in airtight container as 'śuddha vaikrānta' for further pharmaceutical use.

**Vaikrānta śodhana- 3rd method:**

(R. R. S. 2/66)
कुलत्थक्वाथसंस्विन्नो वैक्रान्तः परिशुध्यति ।।

The roughly pounded 'aśuddha vaikrānta' is tied in a 'poṭṭalī', hung in 'dolāyantra' and subjected for 3 hours (one yāma) of 'swedana' by keeping 'kulattha kwātha' as liquid media. Later the drug is washed, dried and stored in airtight container as 'śuddha vaikrānta' for further pharmaceutical use.

### Vaikrānta śodhana- 4th method:

हयमूत्रेण तत्सेच्यं तप्तं तप्तं त्रिसप्तधा ।। (R. Ci. 7/63)

Aśuddha vaikrānta is heated red hot and dipped in 'haya mūtra' (horse urine). This process of heating and dipping is repeated for 21 times to obtain 'vaikrānta' purified. Later the drug is washed, dried and stored in airtight container as 'śuddha vaikrānta' for further pharmaceutical use.

### Vaikrānta māraṇa- 1st method:

म्रियतेऽष्टपुटैर्गन्धनिम्बुकद्रवसंयुतः । (R. R. S. 2/67)

Required quantity of 'śuddha vaikrānta' is taken in a clean khalva yantra. It is added with equal quantity of 'śuddha gandhaka' and triturated to obtain a homogenous mixture.

This mixture is added with required quantity of 'nimbū swarasa', triturated thoroughly and later dried under hot sun. The dry powder obtained is enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'. This entire process is repeated eight times to obtain appropriately prepared, red coloured 'vaikrānta bhasma'.

### Vaikrānta māraṇa- 2nd method:

वैक्रान्तेषु च तप्तेषु हयमूत्रं विनिक्षिपेत् । पौनःपुन्येन वा कुर्याद् द्रवं दत्त्वा पुटं त्वनु ।।
भस्मीभूतं तु वैक्रान्तं वज्रस्थाने नियोजयेत् ।। (R. R. S. 2/67-68)

Śuddha vaikrānta is heated red hot and sprinkled with 'haya mūtra' (horse urine). This process is repeated more than once until the vaikrānta attains fine powder form. This powder is taken in khalva yantra, triturated thoroughly with 'horse urine', cakrikās are prepared, dried under sun and subjected for one 'gajapuṭa'.

The entire process is repeated until appropriate lustre free 'vaikrānta bhasma' is obtained. The bhasma can be used as a substitute for 'vajra bhasma'.

### Vaikrānta māraṇa- 3rd method:

विमलबलिविमिश्रं चूर्णवज्रस्य चूर्णं समदरदसमेतं निम्बुनीरेण पिष्टम् ।
द्विरदपुटसमाख्ये तत् पुटे संपुटस्थं वसुमितपुटपक्वं पञ्चतां याति नूनम् ।। (R. T. 23/163)

Required quantity of 'śuddha vaikrānta' is taken in a clean khalva yantra. It is added with equal quantities of 'śuddha hiṅgula' and 'śuddha gandhaka' and triturated to obtain a homogenous mixture.

This mixture is added with required quantity of 'nimbū swarasa', triturated thoroughly and later dried under hot sun. The dry powder obtained is enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'.

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This entire process is repeated for eight times. After 8th 'gajapuṭa', when the 'sampuṭa' is cool on its own, the medicine inside is collected and stored in suitable airtight container as 'vaikrānta bhasma'.

**Vaikrānta bhasma- properties:**

> वैक्रान्तस्तु त्रिदोषघ्नः षड्रसो देहदार्ढ्य कृत् । पाण्डूदरज्वरश्वासकासक्षयप्रमेहनुत् ।।
>
> (Āy. Pra. 5/167)

Properly prepared 'vaikrānta bhasma' mitigates all the three vitiated doṣa. It possesses all the six rasa. Its judicious administration provides the physical strength and makes the body sturdy and healthy. It cures pāṇḍu roga, udara roga, jīrṇa jwara, nava jwara, śwāsa, kāsa, kṣaya roga and prameha roga.

**Vaikrānta bhasma- dosage:**

> तत्त्वांशतो रक्तिकाया रुद्रांशप्रमितं मृतम् । वैक्रान्तकं प्रयुञ्जीत बलकालाद्यपेक्षया ।।
>
> (R. T. 23/170)

1/24 rattī to 1/11 rattī (5 to 11 mgs) is the general dose of 'vaikrānta bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

**Vaikrānta sattvapātana:**

> सत्त्वपातनयोगेन मर्दितश्च वटीकृतः । मूषास्थो घटिकाध्मातो वैक्रान्तः सत्त्वमुत्सृजेत् ।।
>
> (Ay. Pra. 5/71)

Required quantity of 'śuddha vaikrānta' is taken in a clean khalva yantra. It is added with required quantity of 'sattvapātana yoga' (mitra pañcaka) and triturated thoroughly to prepare 'cakrikās' of desired size.

The cakrikās are dried under sun, enclosed in suitable 'crucible' and subjected for three hours of intense heat with the help of blower to extract white coloured aluminium metal as sattva of 'vaikrānta'.

**Vaikrānta- few compound formulations:**

1. Trailokyacintāmaṇī rasa
2. Sūcikābharaṇa rasa
3. Vasantakusumākara rasa
4. Kāñcanābhra rasa

## 3. MĀKṢIKA

(Copper pyrite or Chalcopyrite; $CuFeS_2$)

**Introduction:**

Mākṣika is the third mineral drug in 'mahārasa group'. It belongs to 'Pyrite' group of minerals. The name pyrite is derived from the Greek '*puritṛs*', which means "of fire" or "in fire". It is usually found associated with other sulfides or oxides in quartz veins, sedimentary rock, and metamorphic rock, as well as in coal beds, and as a replacement mineral in fossils.

Two major varieties in this mineral are; I. Copper pyrite or Chalcopyrite ($CuFeS_2$) and II. Iron pyrite ($FeS_2$);

**Copper pyrite or Chalcopyrite ($CuFeS_2$):**

Chalcopyrite contains copper (35%), iron (30%) and sulphur (35%) as major contents. It has a brassy to golden yellow color and a hardness of 3.5 to 4 on the Mohs scale. It is a chief ore of pure copper. Presence of copper makes it look golden yellow in colour.

On exposure to air, chalcopyrite oxidises to a variety of oxides, hydroxides and sulphates. Associated copper minerals include the sulphides bornite ($Cu_5FeS_4$), chalcocite ($Cu_2S$), covellite ($CuS$), digenite ($Cu_9S_5$); carbonates such as malachite and azurite, and rarely oxides such as cuprite ($Cu_2O$).

**Iron pyrite ($FeS_2$):**

Iron pyrite is an 'iron sulphide' with the formula $FeS_2$. It is the most common of the sulfide minerals. It is unstable in the natural environment; in nature it is always in the process of being created or being destroyed. Iron pyrite when exposed to air and water decomposes into iron oxides and sulphate. This process is hastened by the action of *Acidithiobacillus* bacteria, which oxidise the pyrite to produce ferrous iron and sulphate. These reactions occur more rapidly when the pyrite is in fine crystals and dust, which is the form it takes in most mining operations.

Iron pyrite oxidation is sufficiently exothermic. Therefore the underground coal mines with high-sulphur coal seams to have occasionally had serious problems with spontaneous combustion in the mined-out areas. The solution here is to hermetically seal the mined-out areas to exclude oxygen.

**Occurrence:**

The deposits of mākṣika are found in US, UK, Spain, Canada and Japan. In India, it is found in Bihar, Rajasthan and Andhra Pradesh.

**Properties:**

| | |
|---|---|
| Chemical name and Chemical composition | Copper pyrite (Chalcopyrite) ($CuFeS_2$) and Iron pyrite ($FeS_2$) |
| Hardness | 3.5 to 4 on the Mohs scale |

| | |
|---|---|
| Chalcopyrite contains | Copper (35%), iron (30%) and sulphur (35%) |
| On exposure to air | Oxidises to a variety of oxides, hydroxides and sulphates |

**Mākṣika- brief history:**

The drug 'mākṣika' can be traced from the earliest point of saṁhitā kāla. Its mention in some of the compound formulations is seen in 'Caraka Saṁhita', the oldest among 'Bṛhattrayī'. Later on, this drug is widely mentioned by all most all the cikitsā granthas of Āyurveda. All the rasa granthas have dealt with this drug in detail.

**Mākṣika- two types:**

1. Swarṇa mākṣika (Chalcopyrite or Copper pyrite) ($CuFeS_2$)
2. Rajata mākṣika (Iron pyrite) ($FeS_2$)

**Mākṣika- three types:**

Depending on the colour 'mākṣika' is categorized as;

1. Pīta mākṣika (Swarṇa mākṣika)
2. Śukla mākṣika (Rajata mākṣika) and
3. Rakta mākṣika (Kāṁsya mākṣika)

Note: Out of the above-mentioned types of 'mākṣika', first two (Swarṇa mākṣika and Rajata mākṣika) are fit for therapeutic use. However, the 'Swarṇa mākṣika' is believed to have more therapeutic significance in comparison with 'Rajata mākṣika'. The use of Rakta mākṣika (Kāṁsya mākṣika) is seen less in the classics.

The detailed explanation for both 'Swarṇa mākṣika' (Chalcopyrite or Copper pyrite) ($CuFeS_2$) and 'Rajata mākṣika' (Iron pyrite) ($FeS_2$) is provided below in this chapter.

**Swarṇa mākṣika- synonyms:**

सुवर्णमाक्षिकं स्वर्णमाक्षिकं हेममाक्षिकम् । माक्षीकं माक्षिकञ्चैव ताप्यञ्च धातुमाक्षिकम् ॥
माक्षीकधातुञ्च तथा तापीजञ्चापि तन्मतम् । (R. T. 21/1-2)

Suvarṇa mākṣika, swarṇa mākṣika, hema mākṣika, mākṣīka, mākṣika, tāpya, dhātu mākṣika, mākṣika dhātu, tāpīja (as it is obtained on the banks of river 'tāpī'); all these are the synonymous words of 'swarṇa mākṣika' (Chalcopyrite).

**Rajata mākṣika- synonyms:**

रौप्यमाक्षिकमाख्यातं तारजं तारमाक्षिकम् । विमलं श्वेतमाक्षीकं तथा रजतमाक्षिकम् ॥

ईषद्रौप्यस्य साहित्याद् वा रौप्यगुणसाम्यतः । रौप्यवद् द्युतिमत्त्वाद्वा रौप्यमाक्षिकमुच्यते ।।

(R. T. 21/55-56)

Roupya-mākṣika, tāraja-mākṣika, tāra-mākṣika, vimala-mākṣika, śweta-mākṣika and rajata-mākṣika; all these are the synonymous words used for 'rajata mākṣika'. Since this drug has some ratio of 'rajata' (silver) in it; since it possesses the similar properties as that of silver; and since its outer surface appears more like silver; it is called by all the above synonyms.

**Swarṇa mākṣika- grāhya swarūpa:**

स्निग्धं गुरु श्यामलकान्ति किञ्चित् कषे सुवर्णद्युतिसुप्रकाशम् ।
कोणोज्झितं स्वर्णसमानवर्णं सुवर्णमाक्षीकमिह प्रशस्तम् ।। (R. T. 21/4)

The 'swarṇa mākṣika', which possesses snigdha (smooth) and guru (heavy) guṇa; which will have bluish and blackish shade on the body; which when rubbed on a hard surface, leaves golden lines; which is free from any angles and which possesses golden colour; such a sample of 'swarṇa mākṣika' is considered 'grāhya' and selected for pharmaceutical purposes.

**Rajata mākṣika- grāhya swarūpa:**

स्निग्धं सकोणं गुरु च वर्तुलं रजतोज्ज्वलम् । रौप्यवच्चाकचिक्याढ्य जात्यं तद्रौप्यमाक्षिकम् ।।

(R. T. 21/57)

Rajata mākṣika, which is snigdha with angles, which is heavy and round bodied and which possess the shine and radiance of silver; such a sample is considered fit and selected for pharmaceutical purposes.

**Swarṇa mākṣika- agrāhya swarūpa:**

खरं परं वै गुरुताविहीनं प्रवृत्तकोणं खरलोहकाभम् ।
प्रकीर्तितम् तत्परिहेयमेव सुवर्णमाक्षीकमिहामयज्ञैः ।। (R. T. 21/5)

The 'swarṇa mākṣika', which possesses rough surface, lightweight, angled body and the radiance of 'khara loha'; is considered as 'agrāhya swarṇa mākṣika'. Such a sample is unfit for pharmaceutical or therapeutic use.

**Rajata mākṣika- agrāhya swarūpa:**

समलं लघु रूक्षञ्च कषेऽतिमलिनच्छवि । अवर्तुलं विवर्णञ्च हेयं स्याद्रौप्यमाक्षिकम् ।।

(R. T. 21/58)

Rajata mākṣika, which has unclean body, light in weight with dry surface, when rubbed on a hard surface leaves dirty lines, not round bodied and having pale colour; such a sample is considered unfit and should not be selected for pharmaceutical purposes.

### Swarṇa mākṣika śodhana- necessity:

अशोधितं वाऽमृतमप्यशुद्धं निषेवितं माक्षिकमक्षिबाधाम् ।
मन्दानलं कुष्ठहलीमकादीन् कोष्ठानिलं वै जनयेन्नितान्तम् ।। (R. T. 21/6)

Administration of impure or improperly purified 'swarṇa mākṣika' in any form causes netra roga, agnimāndya, kuṣṭha roga, halīmaka and udaragata vāta prakopa. Therefore, it is always better to use the drug after appropriate purification as per classical references.

### Rajata mākṣika śodhana- necessity:

अशुद्धं रौप्यमाक्षीकं स्वर्णमाक्षिकवद् भृशम् । जनयत्याशु मन्दाग्निं तथा कुष्ठादिकान् गदान् ।।
(R. T. 21/59)

Impure or improperly purified 'rajata mākṣika' administered in any form will be as hazardous as 'aśuddha swarṇa mākṣika' (find above). It causes loss of appetite and may induce kuṣṭha (skin diseases) and such other serious diseases in the person.

### Swarṇa mākṣika śodhana- 1st method:

एरण्डतैललुङ्गाम्बुसिद्धं शुद्धयति माक्षिकम् । सिद्धं वा कदलीकन्दतोयेन घटिकाद्वयम् ।।
(R. R. S. 2/78)

The powder of 'swarṇa mākṣika' is tied in a cloth like 'poṭṭalī' and hung in 'dolāyantra' having 'eraṇḍa taila' or 'mātuluṅga swarasa' or 'kadalī kanda swarasa' as liquid media.

The 'dolāyantra' is placed over mild fire and cooked for 6 hours. Later this drug is washed, dried and stored in suitable airtight container as 'śuddha swarṇa mākṣika' for further pharmaceutical use.

### Swarṇa mākṣika śodhana- 2nd method:

तप्तं क्षिप्तं वराक्वाथे शुद्धिमायाति माक्षिकम् ।। (R. R. S. 2/78)

The pieces of 'swarṇa mākṣika' are heated red hot and dropped in a vessel containing freshly prepared 'triphalā kwātha'. This process is repeated for 7 times to obtain 'śuddha swarṇa mākṣika', which can be used for further pharmaceutical purposes.

### Rajata mākṣika śodhana:

मेषशृङ्गीरसेनापि दोलायन्त्रे विधानतः । पाचितं रौप्यमाक्षीकं शुद्धिमायात्यनुत्तमाम् ।। (R. T. 21/66)

The pieces of 'grāhya rajata mākṣika' are tied in a cloth like 'poṭṭalī' and hung in 'dolāyantra' having 'meṣaśṛṅgī rasa' as liquid media. The 'dolāyantra' is placed over mild fire and cooked for two yāma (6 hours).

When cool on its own, the drug inside the 'poṭṭalī' is collected, washed and dried well under sun. Later it is powdered and stored in suitable airtight container as 'śuddha rajata mākṣika' for further pharmaceutical use.

### Swarṇa mākṣika māraṇa- 1st method:

मातुलुङ्गाम्बुगन्धाभ्यां पिष्टं मूषोदरे स्थितम् । पञ्चक्रोडपुटैर्दग्धं म्रियते माक्षिकं खलु ।।

(R. R. S. 2/79)

One part of 'śuddha swarṇa mākṣika' and one part of 'śuddha gandhaka' are taken in a clean khalva yantra. It is added with required quantity of 'nimbū swarasa' and triturated thoroughly to prepare 'cakrikās' (pellets) of even size and shape. The pellets are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'puṭa' (varāha puṭa).

This entire procedure is repeated five times to subject the drug for 5 'puṭa'. After 5th puṭa cools down on its own, the properly prepared, red coloured 'swarṇa mākṣika bhasma' inside the 'sampuṭa' is collected and stored in suitable airtight container for further pharmaceutical or therapeutic use.

### Swarṇa mākṣika māraṇa- 2nd method:

ताप्यं निम्ब्वम्लसंपक्वं पुनर्निम्बूकवारिणा । सम्पेष्य सम्पुटस्थन्तु पुटयेत् कृतचक्रिकम् ।।
एवं दशपुटैरेव पञ्चतामेति माक्षिकम् । रक्तोत्पलदलच्छायं जायते चातिशोभनम् ।। (R. T. 21/19-20)

The 'śuddha swarṇa mākṣika' purified by triturating with 'nimbū swarasa' is taken in a clean khalva yantra. It is again added with required quantity of 'nimbū swarasa' and triturated thoroughly to prepare 'cakrikās' (pellets) of even size and shape. The pellets are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'puṭa' (varāha puṭa).

This entire procedure repeated ten times to subject the drug for 10 'puṭa'. After 10th puṭa cools down on its own, the properly prepared, red coloured 'swarṇa mākṣika bhasma' inside the 'sampuṭa' is collected and stored in suitable airtight container for further pharmaceutical or therapeutic use.

### Rajata mākṣika māraṇa- similarity:

स्वर्णमाक्षिकवत्कार्यं रौप्यमाक्षिकमारणम् । प्रयोगाल्पतया चास्य व्याख्यानं नाधिकं कृतम् ।।

(R. T. 21/68)

The incineration procedures of 'rajata mākṣika' are similar as that of the procedures followed for the incineration of 'swarṇa mākṣika'. Since, the 'rajata mākṣika' is used less for therapeutic purposes, more explanation in this regard is not so essential.

### Swarṇa mākṣika bhasma- properties:

सुवर्णमाक्षिकं वृष्यं मधुरं तु रसायनम् । तिक्तं स्वर्यञ्च चक्षुष्यं त्रिदोषघ्नं परं मतम् ।।
क्षयमर्शांसि मेहानि विविधा बस्तिवेदनाः । पाण्डुश्वयथुकुष्ठानि विषदोषादिकान् हरेत् ।।
जीर्णज्वरमपस्मार मन्दानलमरोचकम् । अनिद्रां नाशयत्याशु योगवाहि परं मतम् ।।

(R. T. 21/26-28)

Properly prepared 'swarṇa mākṣika bhasma' is aphrodisiac. It possesses madhura rasa, rasāyana guṇa and partial tikta rasa. It is good to throat and voice. It is good to the eyes and mitigates tridoṣas.

It cures kṣaya roga, arśa roga (haemorrhoids), prameha roga (diabetes), all types of basti vedanā, pāṇḍu roga (anaemia), śwayathu (oedema), kuṣṭha roga (skin diseases) and viṣa doṣa (toxic effects of poisons in the body).

It is also useful in jīrṇa jwara (chronic fever), apasmāra (epilepsy), mandāgni (loss of appetite), aruci (tastelessness) and anidrā (insomnia). It is a good 'yogavāhī' (with synergistic effect).

### Rajata mākṣika bhasma- properties:

स्वर्णमाक्षिकवज्ज्ञेया विमलस्य गुणा बुधैः । मात्रां चामयिकं योगं तथैव परिलक्षयेत् ।।

(R. T. 21/69)

The 'guṇa', 'mātrā' and 'āmayika prayoga' of 'rajata mākṣika bhasma' are considered similar to the properties of 'swarṇa mākṣika bhasma'.

### Mākṣika bhasma- dosage:

गुञ्जार्द्धतः समारभ्य बलकालाद्यपेक्षया । गुञ्जाद्वितयपर्यन्तं माक्षिकं योजयेद्भिषक् ।।

(R. T. 21/29)

Half rattī (62 mgs) to two rattī (250 mgs) is the general dosage of 'mākṣika bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

It is administered along with 'triphalā cūrṇa', 'trikaṭu cūrṇa', 'viḍaṅga cūrṇa', 'ghee' or 'honey' as adjuvant.

(Āy. Pra. 4/10)

अनुपानं वरा व्योषं वेल्लं साज्यं हि माक्षिके ।

### Aśuddha mākṣika bhasma- hazards and its measures:

(Rasarājasundara)

अशुद्धं माक्षिकं कुर्यादान्ध्यं कुष्ठं क्षयं क्रिमीन् ।

Consumption of impure or improperly prepared 'mākṣika bhasma' causes andhatwa (blindness), kuṣṭha roga (skin diseases), kṣaya roga and kṛmi roga.

To cure all these complaints, the person is administered daily with 'kūlattha kwātha' or 'dāḍima twak kwātha' until all the toxic symptoms come down.

कुलत्थस्य कषायेण माक्षीकविकृतिं जयेत् । दाडिमस्य त्वचो वाऽपि प्रोक्ता विकृतिनाशिनी ।।
(Bṛhad Rasarājasundara)

**Swarṇa mākṣika sattwapātana:**

पादांशटङ्कणोपेतं मर्दितं हेममाक्षिकम् । ध्मातं मूषागतं सत्त्वं मुञ्चत्याशु सुनिश्चितम् ।।
(R. T. 21/46)

One part of 'śuddha swarṇa mākṣika' is triturated with quarter part of 'śuddha ṭaṅkaṇa'. The mixture is enclosed in a strong 'mūṣā' (crucible), placed in intense fire and heated until the 'mākṣika sattva' (copper) is obtained (heated for a day).

**Rajata mākṣika sattwapātava:**

पादांशटङ्कणोपेतो लकुचद्रावमर्दितः । विमलः सुचिरं ध्मातः सत्त्वं सीसोपमं त्यजेत् ।।
(R. T. 21/70)

One part of 'rajata-mākṣika' is taken in a clean khalva yantra. It is added with quarter part of 'śuddha ṭaṅkaṇa' and triturated to obtain a homogenous mixture.

This mixture is added with required quantity of 'lakuca swarasa' and triturated thoroughly. This mixture is enclosed in suitable 'crucible' and subjected for high flame to extract 'lead' like 'rajatamākṣika sattva'.

**Swarṇa mākṣika- few compound formulations:**

1. Candraprabhā vaṭī
2. Ratnagarbha poṭṭalī
3. Pañcāmṛta parpaṭī
4. Grahaṇīkapāṭa rasa
5. Jayamaṅgala rasa

## 4. VIMALA

(Iron pyrite: $FeS_3$)

**Introduction:**

Vimala is the fourth mineral drug in 'mahārasa group'. It belongs to 'Pyrite' group of minerals. The name pyrite is derived from the Greek '*puritṛs*', which means "of fire" or "in fire". It is usually found associated with other sulfides or oxides in quartz veins, sedimentary rock, and metamorphic rock, as well as in coal beds, and as a replacement mineral in fossils.

**Iron pyrite ($FeS_3$):**

Chemically 'vimala' is identified as 'Iron pyrite' ($FeS_3$). Iron pyrite is an 'iron sulphide' with the formula $FeS_3$. It is the most common of the sulfide minerals. It is unstable in the natural environment; in nature it is always in the process of being created or being destroyed. Iron pyrite exposed to air and water decomposes into iron oxides and sulphate. This process is hastened by the action of *Acidithiobacillus* bacteria, which oxidize the pyrite to produce ferrous iron and sulphate. These reactions occur more rapidly when the pyrite is in fine crystals and dust, which is the form it takes in most mining operations.

Iron pyrite oxidation is sufficiently exothermic. Therefore the underground coal mines with high-sulphur coal seams to have occasionally had serious problems with spontaneous combustion in the mined-out areas. The solution here is to hermetically seal the mined-out areas to exclude oxygen.

**Occurrence:**

The deposits of 'Iron pyrite' are found in US, UK, Spain, Canada and Japan. In India, it is found in Assam, Orissa, Bengal, Bihar, Tamil Nadu and Andhra Pradesh.

**Properties:**

| | |
|---|---|
| Chemical name | Iron pyrite |
| Chemical composition | $FeS_3$ |
| Hardness | 6-6.5 on the Mohs scale |
| Specific gravity | 5 |
| Solubility | Insoluble in water |
| Heat exposure | Burns with white flame and sulphur odour |

**Vimala- brief history:**

The details about 'vimala' was not found in the books of 'Āyurveda' up to 9th century. In 10th century, 'Rasārṇava' was the first book to explain about this mineral. From then on all the books have considered 'vimala' as an important 'rasa dravya' and have listed in 'mahārasa' group.

**Vimala- synonyms:**

There are no synonyms for this rasa dravya in any classical references.

**Vimala- three types:**

विमलस्त्रिविधः प्रोक्तो हेमाद्यस्तारपूर्वकः । तृतीयः कांस्यविमलस्तत्तत्कान्त्या स लक्ष्यते ॥
(R. R. S. 2/95)

1. Hema vimala (golden yellow)
2. Tāra vimala (silver white)
3. Kāṁsya vimala (bronze coloured)

The similar categorization is reiterated by another reference provided below;

विमलस्त्रिविधो देवि! शुक्लः पीतश्च लोहितः । (Rasārṇava)

**Vimala- śreṣṭhatā:**

पूर्वो हेमक्रियासूक्तो द्वितीयो रूप्यकृन्मतः । तृतीयो भेषजे तेषु पूर्वपूर्वो गुणोत्तरः ।। (R. R. S. 2/96)

Out of above mentioned types of 'vimala', 'hema vimala' is considered best from therapeutic point of view followed by 'tāra vimala' (better) and 'kāṁsya vimala' (good).

**Vimala- grāhya swarūpa:**

वर्तुलः कोणसंयुक्तः स्निग्धश्च फलकान्वितः । (R. R. S. 2/96)

The 'hema vimala', comes in cubic shaped, golden coloured pieces. It possesses multiple angles and surfaces (usually six to eight). It is smooth and soft to touch. When exposed to fire, burns with sulphur odour.

**Vimala śodhana:**

आटरूषजले स्विन्नो विमलो विमलो भवेत् । जम्बीरस्वरसे स्विन्नो मेषश्रृङ्गीरसेऽथवा ।।
आयाति शुद्धिं विमलो धातवश्च यथाऽपरे ।। (R. R. S. 2/98-99)

The pieces of 'hema vimala' are tied in a cloth like 'poṭṭalī' and hung in 'dolāyantra' having 'vāsā swarasa or kwātha' or 'jambīra nimbū swarasa' or 'meṣaśṛṅgī swarasa' as liquid media. The 'dolāyantra' is placed over mild fire and cooked for one yāma (3 hours).

When cool on its own, the drug inside the 'poṭṭalī' is collected, washed and dried well under sun. Later it is powdered and stored in suitable airtight container as 'śuddha vimala' for further pharmaceutical use.

**Vimala māraṇa:**

गन्धाश्मलकुचाम्लैश्च म्रियते दशभिः पुटैः । (R. R. S. 2/100)

One part of 'śuddha vimala' and one part of 'śuddha gandhaka' are taken in a clean khalva yantra. It is added with required quantity of 'lakuca phala swarasa' and triturated thoroughly to prepare 'cakrikās' (pellets) of even size and shape. The pellets are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'puṭa' (gajapuṭa).

This entire procedure repeated ten times to subject the drug for 10 'puṭa'. After 10th puṭa cools down on its own, the properly prepared, red coloured 'vimala bhasma' inside the 'sampuṭa' is collected and stored in suitable airtight container for further pharmaceutical or therapeutic use.

**Vimala bhasma- properties:**

मरुत्पित्तहरो वृष्यो विमलोऽतिरसायनः । (R. R. S. 2/96)
विमलाया गुणाः किञ्चिन्न्यूनाः कनकमाक्षिकात् ।। (Āy. Pra. 4/24)

Properly prepared 'vimala bhasma', mitigates vitiated pitta doṣa. It is a good aphrodisiac and rejuvenator. All its other properties are almost similar to that of 'swarṇa mākṣika bhasma'.

### Vimala bhasma- dosage:

Half rattī (62 mgs) to two rattī (250 mgs) is the general dosage of 'vimala bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

### Aśuddha vimala bhasma toxicity- measures:

> विकारो यदि जायेत् विमलाया निषेवनात् । शर्करा सहिता भक्षेत् मेषश्रृङ्गी दिनत्रयम् ।।

(Bṛhad Rasarājasundara)

To cure any of the toxic symptoms induced by consumption of impure or improperly prepared 'vimala bhasma', the person is administered with 'meṣaśṛṅgī cūrṇa' added with 'sugar'; daily for three days or until all the toxic symptoms come down.

### Vimala sattwapātana:

> सटङ्कलकुचद्रावैर्मेषश्रृङ्ग्याश्च भस्मना । पिष्टो मूषोदरे लिप्तः संशोष्य च निरुध्य च ।।
> षट्प्रस्थकोकिलैर्ध्मातो विमलः सीससन्निभः । सत्त्वं मुञ्चति तद्युक्तो रसः स्यात्स रसायनः ।।

(R. R. S. 2/94-95)

One part of 'hema vimala' is taken in a clean khalva yantra. It is added with one part each of 'śuddha ṭaṅkaṇa' and 'meṣaśṛṅgī bhasma' and triturated to obtain a homogenous mixture.

This mixture is added with required quantity of 'lakuca swarasa' and triturated thoroughly. This mixture is enclosed in suitable 'crucible' and subjected for high flame (with 6 prastha of charcoal) to extract 'lead' like 'vimala sattva'.

### Vimala- few compound formulations:

1. Kṣayakesarī rasa (Bṛhat)
2. Navaratnarājamṛgāṅka rasa
3. Rasendracūḍāmaṇī rasa

## 5. ŚILĀJATU

(Black bitumen; Asphaltum punjabinum)

### Introduction:

Adrija or Śilājatu or Śilājita is the fifth mineral drug in 'mahārasa group'. Śilajatu, consists of two terminologies; one is 'śilā', which means the rock or the mountain and the other one 'jatu', which is a 'lākṣā' (kind of resin) that trickles down from the Himalayan Mountains region of India during summer. The term 'śilājita' is also interpreted as the one which conquers the mountains.

It is also called as 'Black bitumen' and 'Asphaltum punjabinum'. Asphalt also known as bitumen, is the sticky, black and highly viscous liquid or semi-solid present in most crude petroleums and in some natural deposits; it is a substance classed as a pitch.

The terms 'asphalt' and 'bitumen' are often used interchangeably to mean both natural and manufactured forms of the substance. Naturally occurring asphalt is sometimes specified by the term "crude bitumen"; its viscosity is similar to that of cold molasses.

**Chemical components:**

The main and active component of Asphaltum punjabinum (śilajita) is fulvic acid, which is considered as the strongest natural electrolyte. Fulvic acid is an unusual collection of hormones, nutrients, antioxidants, enzymes, amino acids, superoxide dismutases, free-radical scavengers, bactericidal substances, antiviral, antifungal, biochemicals, and phytochemicals.

**Properties:**

| | |
|---|---|
| Identified as | Black bitumen or Asphaltum punjabinum |
| Appearance | Blackish and shiny |
| Odour | Pungent like cow's urine |
| Composition | Minerals 38.65 %, organic substances 36.2 %, water 9.5 %, nitrogenous substance 1.3%, lime 7.8 % and mica 1.35 % |
| Solubility | It slowly dissolves in water but is insoluble in alcohol, ether and chloroform |
| Heat exposure | Melts and burns without fumes and smoke |

**Śilājatu- brief history:**

The reference for 'śilājatu' can be traced back to 'saṁhitā' period. Its usage is found in all the three 'bṛhattrayī'. Its special mention can be traced in the treatment of 'prameha roga'. Maharṣi Caraka mentions 4 types of 'śilājatu', where as Maharṣi Suśruta mentions 6 types. Its use for therapeutic purposes can be traced from almost all the classical texts.

**Śilājatu- synonyms:**

शिलाजतु च शैलेयं शिलाजं शैलधातुजम् । शिलामयः शिलास्वेदः शिलानिर्यास इत्यपि ।।

अश्मजं त्वश्मजतुकं  गिरिजं त्वद्रिजं तथा । अश्मोत्थमश्मलाक्षा च गैरयञ्च मतन्तु तत् ।।

(R. T. 22/60-61)

Śilājatu, śaileya, śilaja, śaila-dhātuja, śilāmaya, śilāsweda, śilāniryāsa, aśmaja, aśmajatuka, girija, adrija, aśmottha, aśmalākṣā and gaireya; all these are the synonymous words used in the classics for the drug 'śilājatu' (Black bitumen or Asphaltum punjabinum).

**Śilājatu- description:**

सूर्यसन्तापसंतप्ताः शिलाः शैलाधिपस्य यद् । गाढं मुञ्चन्ति निर्यासं तच्छिलाजतु कीर्तितम् ।।
शैलाधिपशिलासारो निर्गतो रवितापतः । शुष्कः सन्मूर्ततां यातः शिलाजतु निगद्यते ।।

(R. T. 22/62-63)

During hot summer season (April and May), the temperature in the mountain of 'Himālayan range' rises. As a result of which, the thick essence from the surface of these rocks oozes out. It dries up and collects in between these rocks. This blackish rock-essence is called as 'śilājatu'.

Or, the essence of Himalayan mountain rocks is secreted out because of the fierce sun, dries up and collects in between the rock cleavages like that of black coal. This coal like rock-essence is called as 'śilājatu'.

**Śilājatu- types:**

(I) Śilājatu has been of two types as per many books of 'Rasaśāstra';

1. Gomūtragandhi śilājatu (Black bitumen)
   - i. Sasattwa
   - ii. Niḥsattwa
2. Karpūragandhi śilājatu (Potassium nitrate)

(II) Depending the 'sattva' (essence) present in the drug it has been classified as below;

| Śilājatu | C. S. | S. S./A. Hṛ. | R. R. S. | R. Ci./ R. Kā. |
|---|---|---|---|---|
| Swarṇādrija | + | + | + | + |
| Rajatādrija | + | + | + | + |
| Tāmrādrija | + | + | + | + |
| Lohādrija | + | + | + | + |
| Nāgādrija | – | + | – | + |
| Vaṅgādrija | – | + | – | + |

References:

हेम्नश्च रजतात्ताम्राद्वरं कृष्णायसादपि ।
त्रप्वादीनां तु लोहानां षण्णामन्यतमान्वयम् ।।

(C. S. Ci. 1/3/45)

(S. S. Ci. 13/5)

त्रप्वादीनि त्रपु-सीस-ताम्र-रजत-स्वर्ण-कृष्णलोहानि षट् ।। (Ḍahlaṇa commentary)
सौवर्णं राजतं ताम्रं लौहञ्चेति विभेदतः । शिलाजतु समाख्यातं भिषग्भिस्तु चतुर्विधम् ।।
(R. T. 22/64)

**Śilājatu- types and properties:**

स्वर्णगर्भगिरेर्जातो जपापुष्पनिभो गुरुः । रौप्यगर्भगिरेर्जातं मधुरं पाण्डुरं गुरु ।
ताम्रगर्भगिरेर्जातं नीलवर्णं घनं गुरु ।। (R. R. S. 2/111-113)

1. Swarṇādrija: The śilājatu, which originates from the mountains rich in 'gold mineral', which is reddish like 'japā puṣpa' and which is heavy is identified as 'swarṇādrija'.
2. Rajatādrija: The śilājatu, which originates from the mountains rich in 'silver mineral', which is madhura, pale white (pāṇḍu varṇa) in colour and which is heavy is identified as 'rajatādrija'.
3. Tāmrādrija: The śilājatu, which originates from the mountains rich in 'copper mineral', which is bluish in colour and which is hard and heavy is identified as 'tāmrādrija'.

**Śilājatu- properties:** (R. T. 22/65-68)

1. Swarṇagarbha śilājatu possesses 'śīta' guṇa; madhura, tikta, kaṭu rasa; kaṭu vipāka; and appears like 'japākusuma'.
2. Rajatagarbha śilājatu will have 'śīta' guṇa; pale colour (pāṇḍu varṇa), tikta rasa and madhura vipāka.
3. Tāmragarbha śilājatu will have, tikta rasa; tīkṣṇa, uṣṇa guṇa; and it possesses blue colour.
4. Lohagarbha śilājatu will have tikta, lavaṇa and kaṣāya rasa; kaṭu vipāka; śīta, guru and snigdha guṇa; it possesses black colour.

**Grāhya śilājatu- confirmatory tests:**

The confirmatory tests of a genuine 'śilājatu' sample;

1. When a small piece of 'śilājatu' is placed over glowing charcoal, it should not produce any smoke.
2. Instead, it should melt and swell to attain the shape of 'liṅga'.
3. When put on the surface of stable water taken in a bowl, it should go down in the fashion of sinking threads.
4. However, it should not dissolve in water.
5. It should possesses 'kaṭu' and 'tikta' rasa.

Such a sample of 'śilājatu' is considered as genuine variety that can be used for therapeutic purposes.

वह्नौ क्षिप्तं भवेद्यत्तल्लिङ्गाकारमधूमकम् । सलिलेऽप्यविलीनं च तच्छुद्धं हि शिलाजतु ॥
(R. R. S. 2/114)

याङ्गारसंस्था निर्धूमा पक्वा लिङ्गोपमा भवेत् । (R. T. 22/82)

सलिले या विनिक्षिप्ता तन्तुप्रसवकारिणी । आस्वादे कटुतिक्ता च शिलालाक्षा तु साऽमला ॥
(R. T. 22/83)

**Śilājatu śodhana- necessity:**

अशुद्धं दाहमूर्च्छायभ्रमपित्तास्रशोषकृत् । शिलाजतु विधत्ते हि मान्द्यमग्नेश्च विड्ग्रहम् ॥
(Āy. Pra. 4/105)

Administration of impure or improperly purified 'śilājatu' causes dāha (burning sensation), mūrcchā (loss of consciousness), bhrama (giddiness), raktapitta, śoṣa (kṣaya) and agnimāndya. Therefore, purification of 'śilājatu' becomes a necessity.

**Śilājatu śodhana- 1st method:**

क्षाराम्लगोजलैर्धौतं शुद्ध्यत्येव शिलाजतु । (R. R. S. 2/116)

Thorough washing of 'śilājatu' in any of the 'kṣāra drava' (alkaline liquids), 'amla drava' (sour liquids) or 'gomūtra' (fresh cow's urine) will purify the drug. Here the 'śilājatu' is added with enough quantity of above specified liquids, stirred well, filtered into larger trays and dried under sun to obtain 'śuddha śilājatu'.

**Śilājatu śodhana- 2nd method:**

शिलाधातुं च दुग्धेन त्रिफलामार्कवद्रवैः । लोहपात्रे विनिक्षिप्य शोधयेदति यत्नतः ॥
(R. R. S. 2/117)

Thorough washing of 'aśuddha śilājatu' in 'godugdha' (cow's milk), 'triphalā kwātha' or 'bhṛṅgarāja swarasa' will purify the drug. Here the 'śilājatu' is added with enough quantity of above specified liquids in a stainless steel vessel, stirred well, filtered into larger trays and dried under sun to obtain 'śuddha śilājatu'.

**Śilājatu śodhana- 3rd method:**

क्षाराम्लगुग्गुलूपेतैः स्वेदनीयन्त्रमध्यगैः । स्वेदितां घटिकामानाच्छिलाधातुर्विशुद्ध्यति ॥
(R. R. S. 2/118)

Aśuddha śilājatu is triturated along with equal quantity of 'yavakṣāra' and 'śuddha guggulu'. This mixture is placed over the cloth tied at the neck of the 'swedanī yantra', which contains 'kāñjī' (amla drava) as liquid media. The vessel is placed over fire and cooked for one prahara (3 hours) to obtain 'śuddha śilājatu'.

**Śilājatu- detailed method of purification:** (R. T. 22/69-78)

In the summer seasons with no clouds and no strong winds, the 'śilājatu śodhana' should be taken up. To carry on the process, more than one bigger sized, wide mouthed vessel (kaḍhāhī or tray) are taken.

In one vessel (kaḍhāhī), one part of 'aśuddha śilājatu cūrṇa' is taken. It is added with two parts of 'hot water' and half part of 'triphalā kwātha'. The mixture is stirred to dissolve the 'śilājatu' and later placed under the sun for one yāma (3 hours). Later the mixture is macerated well under sun and filtered through a strong cloth into the second selected vessel.

This second vessel containing the blackish solution of 'śilājatu' is placed undisturbed under hot sun. When the blackish creamy layer surfaces over the liquid, it is carefully skimmed off into the 'third vessel' containing required quantity of hot water.

When the blackish creamy layer resurfaces in the third vessel, it is again skimmed off to the fourth vessel containing required quantity of hot water. Like this, the process of placing the vessel (containing śilājatu and hot water) under hot sun and skimming off the surfaced creamy layer into another vessel is continued until the water in the vessel remains colourless. Moreover, all the physical impurities (sand, gravels etc) in the 'śilājatu' remain back in the previous vessels.

Finally, the surfaced blackish creamy layer of 'śilājatu' is skimmed off into a clean stainless steel tray. It is placed under sun, dried and later used as the 'śuddha śilājatu' for all pharmaceutical purposes.

Note: When the vessels containing 'śilājatu' and 'water' are placed under sun during the process, one should take care that the dust does not fall into it. To avoid the fall of dust into it, a transparent wide glass may be placed over the mouth of the vessel. It is also better to keep the vessel undisturbed before and during skimming off its creamy layer.

To prepare decoction which is required during 'śilājatu śodhana' the following reference is followed;

शिलाजतु समं क्वाथः जलमष्टगुणं ततः । पदांशशेषितः क्वाथ शिलामयविशुद्धये ।।

(R. T. 22/79)

During 'śilājatu śodhana', the required 'triphalā kwātha' is prepared as follows; the course powder of 'triphalā' is taken in a decoction vessel in equal

dr.keshav raj

quantity to that of 'aśuddha śilājatu'. It is added with eight times of water and cooked over mild fire. When the liquid is reduced to quarter, the liquid is filtered and used as 'triphalā kwātha' for 'śilājatu śodhana'.

Note: The 'triphalā kwātha' may be replaced with fresh 'gomūtra' (R. T. 22/80) or 'bhṛṁgarāja swarasa' (R. T. 22/81) and the same purification method may be followed to obtain 'śuddha śilājatu'

Note: After 'sāmānya śodhana' of 'śilājatu' (explained above) to gain special 'doṣa śamana' properties in it, the 'śuddha śilājatu' may be subjected to 'bhāvanā' with the decoction or swarasa of the drugs from 'vātahara', 'pittahara' and 'kaphahara' gaṇa.

By doing so, the 'śilājatu' attains special potency to effectively mitigate these 'doṣas' and will be found more efficacious in the indicated disease conditions.

**Sūryatāpī śilājatu:**

The final filtrate during 'śilājatu śodhana' is taken in wide stainless steel trays. The trays are placed daily under hot sun and dried. Later the dry 'śilājatu' is used as 'sūryatāpī śilājatu'.

With this method, the volatile, therapeutic principles in 'śilājatu' may be protected to a larger extent in comparison with the 'agnitāpī' method provided below.

**Agnitāpī śilājatu:**

The final filtrate during 'śilājatu śodhana' is taken in a wide mouthed stainless steel vessel placed over mild fire, boiled and reduced to a thicker consistency and used as 'agnitāpī śilājatu'.

The market sample we get now a days is this type of 'śilājatu'. Majority of the pharmaceutical companies use 'agnitāpī śilājatu' for all pharmaceutical purposes.

**Śilājatu- properties:**

शिलाजतु मतं तित्तं विपाके कटुकं तथा । मूत्रलञ्च विशेषेण योगवाहि रसायनम् ।।
(R. T. 22/84)

Śuddha śilājatu possesses 'tikta' rasa and 'kaṭu' vipāka. It possesses 'diuretic' (mūtrala), 'synergistic' (yogavāhī) and 'rejuvenation' (rasāyana) properties.

**Śilājatu- therapeutic utility:**

जराव्याधिप्रशमनं देहदार्ढ्यकरं परम्। मेधास्मृतिकरं बल्यं क्षीराशी तत्प्रयोजयेत्।। (C. S. Ci. 1/3/9)

Śuddha śilājatu when used judiciously for internal administration, cures the geriatric ailments, makes the body look sturdy, improves intellect, enhances memory power and adds to physical strength.

It is indicated in śotha, pāṇḍuroga, kṣaya, śwāsa, plīha-vṛddhi, jwara, agnimāndya, apasmāra, unmāda, udararoga, arśas and mūtrakṛcchra. It mitigates vitiated vāta doṣa and is beneficial in sthoulya, urakṣata, hṛdaya roga, prameha, udara-śūla, udara-kṛmi, bigger sized mūtrāśmarī, kuṣṭha roga, vamana roga, gulma roga and severe vātarakta roga (R. T. 22/85-86).

**Śilājatu- dosage:**

द्विगुञ्जतः समारभ्य वसुगुञ्जमितं परम् । शिलामयं प्रयुञ्जीत बलकालाद्यपेक्षया ।। (R. T. 22/87)

Two rattī (250 mgs) to eight rattī (1 gm) is the general dosage of 'śuddha śilājatu'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

- As per Maharṣi Caraka:

पलमर्द्धपलं कर्षो मात्रा तस्य त्रिधा मता । (C. S. Ci. 1/3/54)

One pala (48 gms) (uttama mātrā), half pala (24 gms) (madhyama mātrā) and one karṣa (12 gms) (avara mātrā); are the three doses of 'śuddha śilājatu'. However, this dosage seems very high when it comes to therapeutic internal administration and may require essential calibration.

**Śilājatu- duration of administration:**

प्रयोगः सप्तसप्ताहास्त्रयश्चैकश्च सप्तकः । निर्दिष्टस्त्रिविधस्तस्य परो मध्योऽवरस्तथा ।।

(C. S. Ci. 1/3/19)

The duration of 'śuddha śilājatu' as per Maharṣi Caraka is as follows;

| Śuddha śilājatu payoga in.. | Duration of administration |
|---|---|
| Prabala rogāvasthā | Sapta saptāha; 7 weeks (49 days) |
| Madhyama rogāvasthā | Traya saptāha; 3 weeks (21 days) |
| Avara rogāvasthā | Eka saptāha; 1 week (7 days) |

**Śilājatu- adjuvant:**

पयांसि तक्राणि रसाः सयूषास्तोयं समूत्रा विविधाः कषायाः ।
आलोडनार्थं गिरिजस्य शस्तास्ते ते प्रयोज्याः प्रसमीक्ष्य कार्यम् ।। (C. S. Ci. 1/3/27)

Milk, buttermilk, māṁsarasa, yūṣa, water, cow's urine and suitable decoctions can be used as adjuvant during administration of 'śuddha śilājatu'.

**Śilājatu- māraṇa and sattvapātana:**

Though 'śilājatu māraṇa' and its 'sattvapātana' are mentioned in some of the classical texts of 'Rasaśāstra', these methods do not have any practical significance.

Because, the 'śuddha śilājatu' is directly used for all therapeutic purposes and as an ingredient in majority of compound formulations. Moreover, 'śilājatu bhasma' or 'śilājatu sattva' are neither used for therapeutic purposes nor they are featured in any of the compound formulations. Therefore, the 'śilājatu māraṇa' and its 'sattvapātana' are not described here.

**Śilājatu- few compound formulations:**

1. Ārogyavardhinī rasa
2. Candraprabhā vaṭī
3. Śilājatwādi louha
4. Śilājatwādi vaṭī
5. Śivā guṭikā
6. Laṅkeśwara rasa
7. Sarvamehāntaka rasa
8. Pūrṇacandra rasa
9. Yogarāja rasa
10. Tāpyādi vaṭī

## 6. TUTTHA OR SASYAKA

(Copper sulphate; $CuSO_4$)

**Introduction:**

Tuttha or Sasyaka is the sixth mineral drug of mahārasa group. It is chemically identified as 'Copper sulphate', which is also known as cupric sulphate with the chemical formula $CuSO_4$.

Copper sulphate exists as a series of compounds that differ in their degree of hydration. The anhydrous form is a pale green or grey-white powder, whereas the pentahydrate ($CuSO_4$-$5H_2O$), the most commonly encountered salt, is bright blue. This is the one used for medicinal purposes in the classics of Āyurveda. Other names for copper sulphate are "**blue vitriol**" and "**blue stone**".

Copper sulphate exothermically dissolves in water to give the aquo complex $[Cu(H_2O)_6]^{2+}$, which has octahedral molecular geometry and is para-magnetic.

Copper sulphate pentahydrate decomposes before melting at $150^0$ C, losing two water molecules at $63^0$ C, followed by two more at $109^0$ C and the final water molecule at $200^0$ C.

At $650^0$ C, copper sulphate decomposes into copper oxide (CuO) and sulfur trioxide ($SO_3$). Its blue color is due to water of hydration. When heated in an open flame the crystals get dehydrated and turn greyish-white.

Copper sulphate reacts with concentrated hydrochloric acid very strongly. In the reaction the blue solution of copper turns green, due to the formation of tetrachlorocuprate. Copper sulphate was also used in the past as an emetic. It is still listed as an antidote in the World Health Organization's ATC code V03.

**Occurrence:**

Copper sulphate is mined from some part of Rajasthan in India. In abroad, its mines are found in Germany, Sweden, Spain, France and UK.

**Properties:**

| | |
|---|---|
| Identifies as | Blue vitriol or Bluestone |
| Chemical name | Copper sulphate |
| Chemical composition | $CuSO_4$ |
| Colour | Deep bluish and opaque |
| Solubility | Easily soluble in water |
| Solution | Acidic, turns blue litmus to red |
| Heat exposure | When heated up to $250^0$ C, loses all its water and forms white amorphous powder |

**Tuttha- synonyms:**

तुत्थं तु तुत्थकं तुत्थाञ्जनञ्चापि मयूरकम् । सस्यकं ताम्रगर्भञ्च शिखिग्रीवञ्च तन्मतम् ॥

(R. T. 21/71)

Tuttha, tutthaka, tutthāñjana, mayūraka, sasyaka, tāmragarbha and śikhigrivā; all these are the synonyms used in the classics for 'copper sulphate'. It is called as 'peacock ore' as its colour resembles the neck colour of peacock.

**Tuttha (sasyaka)- brief history:**

The mineral drug 'tuttha' (sasyaka) can be traced from saṁhitā period. It has been mentioned in many places of 'Caraka Saṁhitā' as 'amṛtāsaṅga'. Its name is found in many places of 'Suśruta Saṁhitā' also. Since saṁhitā period, this drug is used for therapeutic purposes. In the classical books of 'Rasaśāstra', this drug has been given due importance and is considered among the mahārasa group as it is useful in pārada jāraṇa and mūrcchanā.

**Tuttha- two types:**

Depending on the availability of the mineral;

1. Swābhāvika tuttha (natural)
2. Kṛttrima tuttha (artificial)

**Tuttha- grāhya swarūpa:**

शिखिकण्ठसमच्छायं गुरु स्निग्धं महोज्ज्वलम् । तुत्थकं शस्यते विज्ञैरन्यद्धीनगुणं मतम् ॥

(R. T. 21/72)

The 'tuttha' (copper sulphate), which possesses deep bluish colour like that of peacock's neck, which is guru (heavy) and snigdha with shiny surface; such a sample is considered fit, selected and used for therapeutic purposes.

### Tuttha śodhana- necessity:

वान्ति भ्रान्तिमशुद्धं तत्कुरुते शोधितं शुभम् । (Āy. Pra. 4/39)

Administration of 'aśuddha tuttha' causes severe vomiting and giddiness. Therefore, it is most essential to purify 'tuttha' before using it for therapeutic purposes.

### Tuttha śodhana- 1st method:

तुत्थं विचूर्ण्य खल्वे नवनिम्बुकोत्थवारा । परिपेषयेद् द्वियामं रसतन्त्रकर्मविज्ञः ।। (R. T. 21/106)

Required quantity of 'aśuddha tuttha' is taken in a clean khalva yantra. It is added with required quantity of 'nimbū swarasa' and triturated thoroughly for two yāma (6 hours).

Later the triturated 'tuttha' in khalva yantra is dried under sun and stored in suitable airtight container as 'śuddha tuttha' for further pharmaceutical or therapeutic use.

### Tuttha śodhana- 2nd method:

रक्तचन्दनमञ्जिष्ठाकषायेण तु भावितम् । सप्तवारं प्रयत्नेन शुद्धिमायात्यनुत्तमाम् ।।
(R. T. 21/108)

Required quantity of 'aśuddha tuttha' is taken in a clean khalva yantra. It is subjected for 7 bhāvanās each with 'raktacandana swarasa' and 'mañjiṣṭhā kwātha'.

Later the dry powder of 'tuttha' in the khalva yantra is collected and stored in suitable airtight container as 'śuddha tuttha' for further pharmaceutical or therapeutic use.

### Tuttha śodhana- 3rd method:

सस्यकं शुद्धिमाप्नोति रक्तवर्गेण भावितम् । स्नेहवर्गेण संसिक्तं सप्तवारमदूषितम् ।।
(R. R. S. 2/129)

Required quantity of 'aśuddha tuttha' is taken in a clean khalva yantra. It is subjected for 7 bhāvanās with swarasa or kwātha of 'raktavarga dravya' (khadira, mañjiṣṭhā, lākṣā, kusumbha etc).

Later the dry powder of 'tuttha' in the khalva yantra is collected and stored in suitable airtight container as 'śuddha tuttha' for further pharmaceutical or therapeutic use.

**Tuttha śodhana- 4th method:**

अम्लवर्गप्रदिष्टेन एकेनाप्यौषधेन तु । भावितं सप्तधा तुत्थं शुद्धिमायात्यनुत्तमाम् ।। (R. T. 21/112)

Required quantity of 'aśuddha tuttha' is taken in a clean khalva yantra. It is subjected for 7 bhāvanās with any of the 'amla dravya'. Later the dry powder of 'tuttha' obtained is collected and stored in suitable airtight container as 'śuddha tuttha' for further pharmaceutical or therapeutic use.

**Śuddha tuttha- lakṣaṇa:**

वान्तिभ्रान्ती यदा न स्तस्तदा शुद्धिं विनिर्दिशेत् । (R. Ci. 7/101)

The primary symptom of 'śuddha tuttha' is that, it should not cause vomiting and giddiness when administered.

**Tuttha māraṇa- 1st method:**

लकुचद्रावगन्धाश्मटङ्कणेन समन्वितम् । निरुध्य मूषिकामध्ये म्रियते कौक्कुटैः पुटैः ।।

(R. R. S. 2/131)

One part each of 'śuddha tuttha', 'śuddha gandhaka' and 'śuddha ṭaṅkaṇa'; are taken in a clean khalva yantra and triturated to obtain a homogenous mixture. This mixture is added with required quantity of 'lakuca swarasa' and triturated thoroughly to prepare the 'cakrikās' (pellets) of even size and shape. These pellets are dried under sun, enclosed in 'mūṣā sampuṭa' and subjected for one 'kukkuṭa puṭa'.

All this procedure is repeated thrice to subject the drug for three 'kukkuṭa puṭa'. Each time 'śuddha gandhaka' and 'śuddha ṭaṅkaṇa' are added. When 3rd puṭa is cool on its own, the appropriate 'tuttha bhasma' free from any of the 'bhasma-doṣas' such as vānti, bhrānti etc is collected and used for therapeutic or pharmaceutical purposes.

**Tuttha māraṇa- 2nd method:**

पलोन्मितं तुत्थकं तु गन्धकन्तु पलार्द्धकम् । शरावसंपुटे न्यस्य मृदा च परिलेपयेत् ।।
पुटत्रयं प्रदातव्यं स्वल्पैरेव वनोत्पलैः । तुत्थकं मृतिमाप्नोति वान्तिभ्रान्त्यादिवर्जितम् ।।

(R. T. 21/125-126)

One pala (48 gms) of 'śuddha tuttha' and half pala (24 gms) of 'śuddha gandhaka' are enclosed in 'śarāva sampuṭa' and subjected for one 'laghu puṭa' using dry cow dung cakes.

Like this, three laghu puṭa are given to the drug by adding half quantity of 'śuddha gandhaka' each time. The 3rd puṭa, will yield appropriate 'tuttha bhasma' free from any of the 'bhasma-doṣas' such as vānti, bhrānti etc.

### Tuttha- therapeutic utility:

Tuttha is used for therapeutic purposes in three forms; 1. Aśuddha tuttha 2. Śuddha tuttha and 3. Tuttha bhasma;

1. Aśuddha tuttha: It induces severe vomiting, so, is useful as viṣaghna or garaviṣaghna. Its application as paste is useful in vraṇa, kaṇḍū, kuṣṭha, świtra, krimi roga and netraroga.
2. Śuddha tuttha: It is useful in curing phiraṅga, upadaṁśa, netraroga, kuṣṭha, tvak-doṣa, vraṇa, viṣa-doṣa and krimi roga. It is also vāmaka.
3. Tuttha bhasma: It possesses lekhana, bhedana, rasāyana, balya and cakṣuṣya properties.

### Tuttha bhasma- properties:

तुत्थकं लेखनं भेदि कषायं मधुरं लघु । कृमिघ्नमथ चक्षुष्यं मेहमेदोहरं परम् ।।
कफपित्तहरं बल्यं शूलहृत्कुष्ठनाशनम् । श्वित्रापहं त्वम्लपित्तहरं चैव रसायनम् ।।
तुत्थं सङ्कोचनकरं नाडीनां बलकृत् परम् । त्वग्दोषशमनं कामं विशेषाद्रुचिरं मतम् ।।
(R. T. 21/127-29)

Properly prepared 'tuttha bhasma' possesses 'lekhana' and 'bhedana' karma, kaṣāya and madhura rasa and laghu guṇa. It is a good 'kṛmighna'. It is useful in netraroga, prameha and medoroga.

It mitigates 'kapha-pitta' doṣa. Its judicious use will improve the physical strength and cures śūla roga, hṛdaya roga, kuṣṭha roga, świtra and amlapitta roga.

It is a good rasāyana (aphrodisiac) if used for longer duration. It possesses 'saṅkocaka guṇa' and strengthens the 'central nervous system'. Its internal or external use will cure many types of skin diseases. Its consumption improves the appetite of the person.

### Tuttha bhasma- dosage:

गुञ्जाष्टमांशतो गुञ्जपादिकं तुत्थकं मृतम् । तत्तद्भेषजयोगेन वीतशङ्कः प्रयोजयेत् ।।
(R. T. 21/130)

One eighth to one fourth of a rattī (15 to 30 mgs) is the general dosage of properly prepared 'tuttha bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

### Tuttha- toxic symptoms and the remedy:

जम्बीररसमादाय यः पिबेच्च दिनत्रयम् । तस्य तुत्थकशान्तिस्यात्तद्वल्लाजेन वारिणा ।।
(Bṛ. R. Rā. Su.)

If 'aśuddha tuttha', 'śuddha tuttha' or 'aśuddha tuttha bhasma' cause vomiting and giddiness, the person is administered with 'jambīra nimbū rasa' or 'lājāmaṇḍa' for three days to cure the same.

### Tuttha sattvapātana- 1st method:

निम्बुद्रवाल्पटङ्काभ्यां मूषामध्ये निरुध्य च । ताम्ररूपं परिध्मातं सत्त्वं मुञ्चति सस्यकम् ।।

(R. R. S. 2/134)

One part of 'śuddha tuttha' and 1/4th part of 'śuddha ṭaṅkaṇa' are taken in a clean khalva yantra and triturated. The mixture is added with required quantity of 'nimbū swarasa', triturated thoroughly, and later dried under sun.

The dry powder obtained is enclosed in 'andhamūṣā' and subjected for intense heat in an oven of glowing charcoal to extract the 'copper' as 'sattva' of 'tuttha'.

### Tuttha- few compound formulations:

1. Jātyādi taila
2. Śikhigrivādi Varti
3. Jātyādi ghṛta
4. Tutthāmṛta malahara
3. Tutthakodaya vaṭī

Note: As 'tāmra' (copper) is obtained as 'sattva' out of '**Bhūnāga sattvapātana**' and '**Mayūrapiccha sattvapātana**', those methods are of relevance here. Details of these methods as per different references may be referred from the chapter 18th chapter (Dhātu Varga/Metals).

### Tutthaka drāva- method of preparation:

द्विगुञ्जतश्चतुर्गुञ्जं तुत्थकं निर्मलीकृतम् । परिस्रुते तु सलिले पञ्चतोलसंकमिते ।।
निक्षिपेदथ विज्ञाय तुत्थकं सर्वथा द्रुतम् । तुत्थद्रवं प्रयुञ्जीत रसतन्त्रविचक्षणः ।।

(R. T. 21/78-79)

Two to four rattī (250 to 500 mgs) of 'nirmalīkṛta tuttha' is taken in the form of fine powder in a suitable glass container. It is added with five tola (60 ml) of 'boiled water' and mixed.

When the 'tuttha' dissolves, the clear liquid is stored as 'tutthaka drāva' for further therapeutic use. It can be judiciously used in suitable disease conditions.

### Tutthāmṛta malahara:

सिक्थतैलं सुविमलं दशतोलकसंमितम् । सुनिर्मलं शिखिग्रीवं खलु विंशतिगुञ्जकम् ।।
आदाय खल्वे सम्पेष्य काचकुप्यां निधापयेत् । कथितोऽयं मलहरस्तुत्थकामृतसंज्ञकः ।।

(R. T. 21/97-98)

1. Siktha taila- 10 tola (120 ml); and 2. Nirmalīkṛta śuddha tuttha- 20 rattī (2.5 gms); both these drugs are taken in specified ratio. The 'siktha taila' is taken in a clean stainless steel vessel placed over mild fire.

When the 'siktha taila' melts completely, the vessel is taken out from fire, added with fine powder of 'śuddha tuttha' and stirred homogenously. When cool on its own, the mixture attains 'malahara' (ointment) consistency. This 'malahara' is later stored in suitable, wide mouthed airtight container as 'tutthāmṛta malahara' for further therapeutic use.

विनाशयेत् प्रलेपेन पामां चिरसमुत्थिताम् ।। (R. T. 21/99)

Tutthāmṛta malahara, when used daily for external application over the affected part, it cures 'pāmā roga'.

## 7. CAPALA

(Selenium; Se)

**Introduction:**

Capala is the seventh mineral drug of mahārasa group. There is ambiguity about the ore of 'capala'. Capala is chemically understood as 'Selenium' with the chemical formula 'Se' (Ref: कविराज नरेन्द्रनाथमित्रकृतः चपलनिर्णयः). On the other hand, many texts of 'Rasaśāstra' compare 'Capala' as 'Bismuth ore'. Out of these two views, 'capala' can be better correlated with 'Selenium' (Se) and not with 'Bismuth' (Bi). Below given are some points to corroborate the same.

Points to disown the comparison of 'capala' with 'bismuth ore':

- Bismuth does not possess any of the properties of 'capala' or its varieties. (śweta, kṛṣṇa and aruṇa capala) explained in the books of 'Rasaśāstra'.
- It has been said that the 'capala' melts like 'vaṅga' (tin), which has melting point of $232^0$C; whereas the bismuth has melting point of $271^0$C.

Why 'Capala' can be better compared with 'Selenium' (Se):

- Capala particles have been quoted to have hexagonal structure and even the selenium particles have hexagonal structure.
- The greyish colour of 'goura capala' resembles the shiny grey colour of selenium.
- The term 'puṣpākṛti' used in relation with 'capala' in rasa texts can be compared with flowery designs of the cut surface of selenium.
- Classics quote that 'capala' melts like 'vaṅga' (tin), which has melting point of $232^0$C; here the pure selenium also has melting point of $217^0$C, which is more nearer in comparison with bismuth.

### Selenium- general information:

**Selenium** is a chemical element with atomic number 34, chemical symbol Se and an atomic mass of 78.96. It rarely occurs in its elemental state in nature or as pure ore compounds.

Selenium (Greek '*selene*' meaning "Moon") was discovered in 1817 by Jūns Jakob Berzelius. Though this drug was discovered in recent century, there are many similarities between 'capala' and 'selenium'. Therefore, one can suppose that, this ore was used in the name of 'capala' since ages.

### Physical properties:

Selenium exists in several allotropes that interconvert upon heating and cooling carried out at different temperatures and rates. As prepared in chemical reactions, selenium is usually amorphous, brick red powder. Upon heating, it softens at $50^{0}$ C and converts to grey selenium at $180^{0}$ C; the transformation temperature is reduced by presence of halogens and amines.

### Properties:

| | |
|---|---|
| Chemical name | Selenium |
| Chemical formula | Se |
| Usually an | Amorphous, brick red powder |
| Atomic number | 34 |
| Atomic mass | 78.96 |
| On heating | Softens at $50^{0}$ C and converts to grey selenium at $180^{0}$ C |

### Capala- definition:

वङ्गवद्द्रवते वह्नौ चपलस्तेन कीर्तितः । (R. R. S. 2/143) (R. T. 9/64)

The term 'capala' means 'unsteady' or 'quick'. Since the mineral melts quickly when heated, it is called as 'capala'. It possesses low melting point of $217^{0}$C, which is almost similar like that of vaṅga (tin) ($232^{0}$ C).

### Capala- types:

(I) Four types according to 'Rasaratna Samuccaya' and 'Rasataraṅgiṇī':

गौरः श्वेतोऽरुणः कृष्णश्चपलस्तु चतुर्विधः । हेमाभश्चैव ताराभो विशेषाद्रसबन्धनः ॥
शेषौ तु मध्यौ लाक्षावच्छीघ्रद्रावौ तु निष्फलौ । (R. R. S. 2/142-143) (R. T. 9/63-64)

There are four varieties of 'capala' depending on their colour as below;

1. Goura capala (Yellowish like gold)
2. Śweta capala (White like silver)
3. Aruṇa capala (Reddish brown coloured)
4. Kṛṣṇa capala (Blackish coloured)

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Out of these four, the 'goura capala' resembles the colour of 'gold'. The 'śweta capala' has the colour of silver. These are used for the purpose of 'pārada bandhana'. The remaining two varieties 'aruṇa capala' and 'kṛṣṇa capala' have low melting point and melt easily when placed over fire. These two varieties (3rd and 4th) are considered unfit for any therapeutic use.

(II) Four types according to 'Rasapaddhati':

चत्वारश्चपला: सितासितहरिच्छोणप्रभेदै: पुन: । (R. Paddhati Mahārasa-prakaraṇa)

There are four varieties of 'capala' depending on their colour as below;

1. Sita capala (White like silver)
2. Asita capala (Blackish coloured)
3. Harita capala (Greenish coloured)
4. Śoṇa capala (Reddish coloured)

(III) Six types according to 'Rasakāmadhenu' and 'Rasarājalakṣmī':

There are six varieties of 'capala' depending on its resemblance/content with different metals;

1. Swarṇa capala
2. Tāra capala
3. Tāmra capala
4. Nāga capala
5. Vaṅga capala
6. Tīkṣṇa capala

**Capala types- tabular representation:**

| Rasaratna Samuccaya and Rasataraṅgiṇī | Rasapaddhati | Rasakāmadhenu and Rasarājalakṣmī |
|---|---|---|
| 1. Goura capala<br>2. Śweta capala<br>3. Aruṇa capala<br>4. Kṛṣṇa capala | 1. Sita capala<br>2. Asita capala<br>3. Harita capala<br>4. Śoṇa capala | 1. Swarṇa capala<br>2. Tāra capala<br>3. Tāmra capala<br>4. Nāga capala<br>5. Vaṅga capala<br>6. Tīkṣṇa capala |

**Capala- structure:**

चपल: स्फटिकच्छाय: षडस्त्र: स्निग्धको गुरु: । (R. R. S. 2/145) (R. T. 9/66)

Capala like that of 'sphaṭika' (Potash alum), possesses six angles. It has 'snigdha' and 'guru' guṇa.

**Nāgasambhūta capala and Vaṅgasambhūta capala:**

त्रिंशत्पलमितं नागं भानुदुग्धेन मर्दितम् । विमर्द्य पुटयेत्तावद्यावत्कर्षावशेषितम् ॥
न तत्पुटसहस्रेण क्षयमायाति सर्वथा । चपलोऽयं समाख्यातो वार्तिकैर्नागसम्भव: ॥
(R. R. S. 8/41-42)

The ores of 'capala' were scarce even in olden days. Therefore, it was artificially prepared in the name of 'Nāgasambhūta capala' and 'Vaṅgasambhūta capala' and used.

The non-incinerable 'nāga' (lead) or 'vaṅga' (tin) left out after subjecting these metals for 'thousand' puṭa each; are identified as 'Nāgasambhūta capala' and 'Vaṅgasambhūta capala' respectively.

### Capala- śodhana:

जम्बीरकर्कोटकश्रृङ्गवेरैर्विभावनाभिश्चपलस्य शुद्धि ॥ (R. R. S. 2/146) (R. T. 9/67)

To purify 'capala', the drug is taken in a clean khalva yantra and subjected for 3 bhāvanās with 'jambīra nimbū swarasa', 'karkoṭaka swarasa' or 'ārdraka swarasa'.

### Capala- māraṇa:

Śuddha capala is taken in a clean khalva yantra along with equal quantity of 'śuddha gandhaka' and triturated to obtain a homogenous mixture. This mixture is now subjected to one bhāvanā with 'nimbū swarasa'.

The dry powder obtained is enclosed in a suitable crucible and subjected for intense heat in 'vālukā yantra' for a day. When self-cool, the red coloured 'capala bhasma' is obtained from the crucible.

### Capala- sattvapātana:

शैलं तु चूर्णयित्वा तु धान्याम्लोपविषैर्विषैः । पिण्ड बद्ध्वा तु विधिवत् पातयेच्चपलं तथा ॥
(R. R. S. 2/147) (R. T. 9/68)

The 'capala' is taken in a clean khalva yantra, added with required quantities of 'dhānyāmla' (āranāla) prepared with any other 'upaviṣa' dravya (viṣatinduka, ahiphena, jayapāla, dhattūra bīja, vijayā, guñjā, bhallātaka, arka kṣīra, snuhī kṣīra, lāṅgalī and karavīra) or with 'viṣa' dravya (vatsanābha) to prepare a bolus.

This bolus is used for extraction of 'capala sattva' through 'ūrdhvapātana' or 'adhaḥpātana' methods. The 'selenium' is extracted as the essence (sattva) of this mineral (capala).

### Capala- properties:

चपलो लेखनः सिद्धो देहलोहकरो मतः । रसराजसहायः स्यात् तिक्तोष्णमधुरा मतः ॥
त्रिदोषघ्नोऽतिवृष्यश्च रसबन्धविधायकः ॥
(R. R. S. 2/144-145)
(R. T. 9/65-66)

Capala when judiciously used for internal administration (in sattva form), it

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exhibits 'lekhana' properties. It makes the body strong and sturdy (like loha). It assists 'pārada' in all its pharmaceutical procedures.

It possesses 'tikta'. 'uṣṇa' and 'madhura' rasa. It can effectively mitigate all the three vitiated doṣas and is a good aphrodisiac (vṛṣya). It is helpful in 'pārada bandhana'.

### Capala- few compound formulations:

Note: As 'capala' is a controversial drug, its use for therapeutic purposes is rare. Therefore, its compound formulations are also very rare.

## 8. KHARPARA (RASAKA)

(Zinc oxide; ZnO)

### Introduction:

Rasaka is the eighth mineral drug of mahārasa group. It is chemically identified as 'Zinc oxide' (ZnO). **Zinc oxide** is an inorganic compound with the formula ZnO. It is a white powder that is insoluble in water, which is widely used as an additive in numerous materials and products including plastics, ceramics, glass, cement, lubricants, paints, ointments, adhesives, sealants, pigments, foods (source of Zn nutrient), batteries, ferrites, fire retardants, and first aid tapes. It occurs naturally as the mineral zincite but most zinc oxide is produced synthetically.

Zinc oxide as a mixture with about 0.5% iron oxide ($Fe_2O_3$) is called calamine and is used in calamine lotion. When mixed with eugenol, a ligand, zinc oxide eugenol is formed, which has applications as a re storative and prosthodontic in dentistry.

Reflecting the basic properties of ZnO, fine particles of the oxide have deodorizing and antibacterial properties and for that reason are added into food packaging.

Zinc oxide is widely used to treat a variety of other skin conditions, in products such as baby powder and barrier creams to treat diaper rashes, calamine cream, anti-dandruff shampoos and antiseptic ointments.

### Occurrence:

The ores of rasaka (zinc) are in Rajasthan, Himachal Pradesh, Sikkim and Kashmir. Outside India its ores are present in Australia, USA, France, Spain and Myanmar.

**Properties:**

| | |
|---|---|
| Chemical name | Zinc oxide |
| Chemical formula | $ZnO$ |
| Used as additive in | Ointments, foods (source of Zn nutrient) and first aid tapes |
| Solubility | Insoluble in water |
| Widely used in | Products such as baby powder, barrier creams to treat diaper rashes, calamine cream, anti-dandruff shampoos and antiseptic ointments |

**Kharpara (rasaka)- synonyms:**

खर्परः खर्परञ्चैव तदेव खर्परीयकम् । रसको रसकञ्चैव मतं यशदकारणम् ।। (R. T. 21/181)
(Rasārṇava)
गोभट्टो रसकस्तुत्थः क्षितिकिट्टो रसोद्भवः ।

Kharpara, kharparīyaka, rasaka, yaśadakāraṇa, gobhaṭṭa, gobaddha, kṣitikiṭṭa and rasodbhava; are the synonymous words used for 'kharpara' (Zinc oxide; ZnO) in the classics.

**Kharpara (rasaka)- brief history:**

The references for kharpara or rasaka can be traced even from oldest of rasa texts. Its sattva is mentioned as 'kharpara sattva' and is used for therapeutic purposes. Later in 14th century, it was named as 'yaśada', probably because of the Arabic word '*jastā*'. The mixture of kharpara sattva and copper was known as '*rīti*' during 'Maharṣi Caraka's' period.

**Kharpara (rasaka)- types:**

(I) Three types according to 'Rasārṇava':

मृत्तिका गुडपाषाणभेदतो रसकस्त्रिधा । पीतस्तु मृत्तिकाकारो मृत्तिकारसको वरः ।।
गुडाभो मध्यमो ज्ञेयः पाषाणाभः कनिष्ठकः । (Rasārṇava 7/28-29)

Mṛttikābha (Zinc oxide), Guḍābha (Zinc sulphide or Zincite) and Pāṣāṇābha (Zinc Silicate or Carbonate); are the three types of rasaka according to 'Rasārṇava'. Mṛttikābha kharpara resembles pale coloured mud and is considered the best variety. Guḍābha kharpara resembles jaggary colour and has medium qualities. Pāṣāṇābha kharpara appears like stone and has least therapeutic values.

(II) Two types according to 'Rasaratna Samuccaya':

रसको द्विविधः प्रोक्तो दुर्दरः कारवेल्लकः । सदलो दुर्दरः प्रोक्तो निर्दलः कारवेल्लकः ।।
सत्त्वपाते शुभः पूर्वो द्वितीयश्चौषधादिषु ।। (R. R. S. 2/149-150)

1. Durdara kharpara and 2. Kāravellaka kharpara; are the two types of 'kharpara'. The 'durdara kharpara' comes with layers and is also called as

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'sadala kharpara'. Whereas the 'kāravellaka kharpara' will be in 'piṇḍa form' and is also called as 'nirdala kharpara'.

Durdara kharpara is suitable for 'sattvapātana' and 'kāravellaka kharpara' is used for compound formulations.

(III) Two types according to 'Rasataraṅgiṇī':

> खर्परो द्विविधः प्रोक्तः सदलो निर्दलस्तथा । सदलो दर्दुराख्यः स्यात्कारवेल्लाभिधोऽपरः ।।
> खर्परं दर्दुराख्यन्तु योजयेत्सत्त्वपातने । औषधेषु च सर्वत्र कारवेल्लं प्रयोजयेत् ।।
>
> (R. T. 21/183-84)

1. Sadala kharpara and 2. Nirdala kharpara are the two types of 'kharpara'. The 'sadala kharpara' comes with layers and is also called as 'durdara kharpara'. Whereas the 'nirdala kharpara' will be in 'piṇḍa form' and is also called as 'kāravellaka kharpara'.

Durdara kharpara is suitable for 'sattvapātana' and 'kāravellaka kharpara' is used for compound formulations.

**Kharpara (rasaka) types- tabular representation:**

| Rasārṇava (7/28-29) | Rasaratna Samuccaya (2/149-150) | Rasataraṅgiṇī (21/183) |
|---|---|---|
| 1. Mṛttikābha (Zinc oxide)<br>2. Guḍābha (Zinc sulphide or Zincite)<br>3. Pāṣāṇābha (Zinc Silicate or Carbonate) | 1. Durdara (Calimine)<br>2. Kāravellaka (Smit Sonite) | 1. Sadala (durdara)<br>2. Nirdala (kāravellaka) |

**Kharpara śodhana- necessity:**

> अशुद्धखर्परः कुर्याद्वान्ति भ्रान्तिं विशेषतः । तस्माच्छोध्यः प्रयत्नेन यावद्वान्तिविवर्जितः ।।
>
> (Āy. Pra. 2/283)

Consumption of impure or improperly purified 'kharpara' caused severe vomiting and giddiness. Therefore, its proper purification is most essential before therapeutic administration.

**Kharpara (rasaka) śodhana- 1st method:**

> प्रस्तरांशपरित्यक्तं खर्परं त्वथ खल्वगम् । निम्बूकस्वरसोपेतं पेषयेत्सप्तवारकम् ।। (R. T. 21/186)

The pieces of the drug 'kharpara (rasaka)' free from physical impurities are taken in a khalva yantra and triturated to obtain fine powder. This powder is subjected for 7 bhāvanās with required quantity of 'nimbū swarasa'.

After 7th bhāvanās, the drug is added with required quantity of water and left for some time. Later the water is decanted and the drug is dried under hot sun. It is powdered and stored in suitable airtight container as 'śuddha kharpara'.

**Kharpara (rasaka) śodhana- 2nd method:**

खर्परः परिसन्तप्तस्तक्रे वा गृहवारिणि । निषिक्तः सप्तवारं तु विमलत्वमवाप्नुयात् ।। (R. T. 21/189)

The pieces of 'kharpara' are heated red-hot and dipped in 'takra' (butter milk) or 'kāñjī' (gṛhavāri). This process of heating and dipping is repeated for 7 times to obtain the 'kharpara' purified.

**Kharpara māraṇa- 1st method:**

खर्परं पारदेनैव चूर्णयित्वा दिनं पचेत् । बालुकायन्त्रमध्यस्थं शोणं भस्म प्रजायते ।।

(Āy. Pra. 2/289)

Two pala (96 gms) of 'śuddha kharpara' is taken in a clean khalva yantra and is added with equal quantity of 'śuddha pārada'. The mixture is triturated thoroughly to obtain it in fine powder form. This dry powder is enclosed in 'śarāva sampuṭa', placed in 'vālukā yantra' and subjected for one day's intense heat.

When cool on its own, the soft, yellowish and attractive drug material inside the 'sampuṭa' is collected, triturated and stored in suitable airtight container as 'kharpara bhasma'.

**Kharpara māraṇa- 2nd method:**

खर्परो विमलः शुद्धस्तुल्यतालकपेषितः । सम्पुटस्थस्त्रिपुटितः सर्वथा मृतिमाप्नुयात् ।।

(R. T. 21/193)

Śuddha kharpara is triturated with equal quantity of 'śuddha haratāla cūrṇa'. This mixture is enclosed in 'śarāva sampuṭa' and subjected for 'laghupuṭa' using dry natural cow dung cakes.

Like this, three 'puṭa' are given to the drug by adding equal quantity of 'śuddha haratāla' each time. After 3rd 'puṭa' is cool on its own, the properly prepared 'kharpara bhasma' inside the 'sampuṭa' is collected, triturated and stored in suitable airtight container.

**Kharpara bhasma- properties:**

सुमृतः खर्परः शीतः कफपित्तापहः परम् । चक्षुष्यः सर्वमेहघ्नो रक्तप्रदरनाशनः ।।
रक्तपीत्ताश्मरीश्वासगुदामयनिषूदनः । जीर्णज्वरहरः कामं त्वतीसारनिबर्हणः ।।
योगवाही विशेषेण त्रिदोषघ्नो विषापहः । विचर्चिकाकुष्ठहरो बलवीर्यविवृद्धिकृत् ।।

(R. T. 21/194-96)

Kharpara bhasma possesses 'śīta vīrya' and mitigates vitiated kapha-pitta doṣa. It is useful in eye diseases, all types of prameha, raktapradara, raktapitta, mūtrāśmarī, śwāsa, gudaja roga, jīrṇa-jwara and atisāra roga.

It possesses 'yogavāhī' (synergistic) property. It cures tridoṣaja diseases like rājayakṣmā. It is used for external application in vicarcikā and kuṣṭha roga. Its judicious use will improve the physical strength and virility in the person.

**Kharpara bhasma- dosage:**

गुञ्जार्द्धतः समारभ्य गुञ्जाद्वितयसंमिता । खर्परस्य मता मात्रा रोगापनयनक्षमा ॥ (R. T. 21/197)

Half rattī (62 mgs) to two rattī (250 mgs) is the general dosage of properly prepared 'kharpara bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

**Kharpara sattvapātana:**

लाक्षाभयाहरिद्रोमागुडरालकटङ्कणैः । यशदप्रभवः पिष्ट एतैस्तु समभागिकैः ॥
मूकमूषागतो ध्मातः सततं प्रखराग्निना । यशदप्रभमत्यच्छं सत्त्वमाशु प्रमुञ्चति ॥
(R. T. 21/207-208)

Required quantity of 'śuddha kharpara cūrṇa' is taken in a clean khalva yantra, added with equal quantity of 'lākṣā', 'harītakī', 'haridrā', 'atasī' (umā), 'guḍa' (jaggary), 'sarjarasa' and 'ṭaṅkaṇa'; and triturated thoroughly to obtain a homogenous mixture. This mixture is placed in 'andha mūṣa' and subjected for intense heat to extract 'zinc' coloured sattva of 'kharpara'.

**Kharpara bhasma toxicity- antidote:**

रसकनिषेवणतो यदि रोगाः प्रादुर्भवन्ति मनुजानाम् । तेनाशमाप्नुवन्ति पीतं गोमूत्रसप्ताहात् ॥
(Bṛ. R. Rā. Su.)

If any toxicity is reported because of 'kharpara bhasma' administration, patient is advised to consume 'cow's urine' for a week as antidote for the same.

**Kharpara (rasaka)- few compound formulations:**

1. Kastūrībhairava rasa
2. Lakṣmīvilāsa rasa
3. Sannipātāntaka rasa
4. Vaidyanātha vaṭī
5. Vasantamālatī rasa
6. Pradarāntaka rasa
7. Mahājwarāṅkuśa rasa

❄

Chapter 16

# UPARASA

## 1. GANDHAKA

(Sulphur)

**Introduction:**

Gandhaka (sulphur) is the first mineral drug in 'uparasa group'. It is a multi-valent non-metal which is abundant. In its native form, sulphur is a yellow crystalline solid, which is odourless and tasteless.

It is a reactive element that given favorable circumstances combines with all other elements except gases, gold, and platinum. Sulphur appears in a number of different allotropic modifications—rhombic, monoclinic, polymeric, and others.

The rhombic structure is the most commonly found sulphur form. Each allotropic form differs in solubility, specific gravity, crystalline arrangement and other physical constants. These various allotropes also can exist together in equilibrium in definite proportions, depending on temperature and pressure.

Chemical name : Sulphur
Chemical formul : S
Atomic number : 16
Atomic mass : 32.06 g /mol-1
Solubility in water : Insoluble
Hardness : 1.5 to 2.5
Specific gravity : 1.9 to 2.1
Melting point : 112.8°C
Boiling point : 444°C (832°F)
Freezing/Melting point : 110-119°C (230-246°F)
Auto-ignition temperature : 248-266°C (478-511°F)

**Sulphur in the environment:**

Life on Earth may have been possible because of sulphur. Conditions in the early seas were such that simple chemical reactions could have generated the range of amino acids that are the building blocks of life.

**Occurrence:**

Sulphur occurs naturally near volcanoes. Native sulphur occurs naturally as massive deposits in Texas and Louisiana in the USA. Other leading producers of sulphur are Canada, Japan, Poland and Soviet Union.

**Health effects of sulphur:**

All living things need sulphur. It is especially important for humans because it is part of the amino acid methionine, which is an absolute dietary requirement for us. The amino acid cysteine also contains sulphur. The average person takes in around 900 mg of sulphur per day, mainly in the form of protein.

**Environment effects of sulphur:**

Sulphur can be found in the air in many different forms. It can cause irritations to the eyes and the throat with animals, when the uptake takes place through inhalation of sulphur in gaseous phase.

The various experimental studies have revealed that the damaging effects of sulphur inhalation are the brain damage, through malfunctioning of the hypothalamus, damage to the nervous system, serious vascular damage in veins of the brain, the heart and the kidneys.

**Ores:**

The significant ores of sulphur are;

1. Copper and Iron pyrite (Swarṇa mākṣika, Roupya mākṣika and Vimala)
2. Copper sulphate (Sasyaka)
3. Ferrus sulphate (Kāsīsa)
4. Galena (Nīlāñjana)
5. Zinc sulphate (Yaśada)
6. Antimony sulphide (Srotoñjana)
7. Orpimant (Haratāla)
8. Realgar (Manaḥśilā)
9. Cinnabar (Hiṅgula)

**Synonyms of gandhaka (sulphur):**

> गन्धको गन्धपाषाणः गन्धी च रसगन्धकः । सुगन्धिको गन्धिकश्च गन्धः सौगन्धिकस्तथा ॥
> पूतिगन्धोऽतिगन्धश्च पामारिः कीटनाशनः । बलिर्बलिवसाख्यश्च कुष्ठारिः शरभूमिजः ॥
> शुल्बारिर्नवनीतश्च दैत्येन्द्रो गन्धमादनः । कीटघ्नः क्रूरगन्धश्च स एव परिकीर्तितः ॥ (R. T. 8/1-3)

Gandhaka, gandhapāṣāṇa, gandhī, rasagandhaka, sugandhika, gandhaka, gandha, sougandhika, pūtigandha, atigandha, pāmāri, kīṭanāśaka, bali, balivasā, kuṣṭhāri, śarabhūmija, śulbāri, navanīta, daityendra, gandhamādana, kīṭaghna and krūragandha; all these are the various synonyms used in the classics for 'gandhaka'.

**Gandhaka- brief history:**

The references for therapeutic as well as pharmaceutical use of 'gandhaka' can be traced since the period of 'Caraka Saṁhitā'. With evolution of 'Rasaśāstra', this mineral was given its due importance.

It is the most useful 'rasa dravya' in both dehavāda and dhātuvāda. It is identified in classics as 'pāmāri' and 'kuṣṭhāri' to indicate its therapeutic significance (dehavāda). It is called 'śulbāri' as it is a useful drug in 'tāmra māraṇa' (incineration of copper).

**Gandhaka- types:**

(I) Three types (Rasaratna Samuccaya 3/12-15):

| Name | Colour | Quality |
|---|---|---|
| 1. Śukacañcunibham | Reddish | Śreṣṭha |
| 2. Pīta varṇa | Yellowish | Madhyama |
| 3. Śweta varṇa | Pale white | Adhama |

(II) Five types (Rasaratna Samuccaya 3/12-15):

| Name | Colour | Quality | Utility |
|---|---|---|---|
| 1. Rakta varṇa | Reddish | Uttama | Dhātuvādārtha |
| 2. Pīta varṇa | Yellowish | Madhyama | Rasa-rasāyanārtha |
| 3. Śweta varṇa | Pale white | Adhama | Lepanārtha & Lohamāraṇa |
| 4. Kṛṣṇa varṇa | Blackish | Durlabha | Jarāmṛtyuhara |

(III) Two types (As per market availability):

| Name | Utility |
|---|---|
| 1. Āmalāsāra gandhaka | Internal use |
| 2. Piṇḍa gandhaka | External use |

- Reference:

स चापि त्रिविधो देवि ! शुकचञ्चुनिभो वरः । मध्यमः पीतवर्णः श्याच्छुक्लवर्णोऽधमः स्मृतः ॥
चतुर्धा गन्धको ज्ञेयो वर्णैः श्वेतादिभिः खलु । श्वेतोऽत्र खटिका प्रोक्तो लेपने लोहमारणे ॥
तथा चामलसारः स्याद्यो भवेत्पीतवर्णवान् । शुकपिच्छः स एव स्याच्छ्रेष्ठो रसरसायने ॥
रक्तश्च शुकतुण्डाख्यो धातुवादविधौ वरः । दुर्लभः कृष्णवर्णश्च स जरामृत्युनाशनः ॥

(R. R. S. 3/12-15)

**Gandhaka- grāhya swarūpa:**

शुकपिच्छसमच्छायो नवनीतसमप्रभः । मसृणः कठिनः स्निग्धः श्रेष्ठो गन्धक उच्यते ॥

(Āy. Pra. 2/20)

The gandhaka, which resembles the colour of 'śukapiccha' (feathers of parrot; yellowish green), which is as soft as butter, smooth but hard and unctuous (snigdha); is considered as the best variety of gandhaka.

### Gandhaka śodhana- necessity:

अशुद्धगन्धः कुरुते च कुष्ठं तापं भ्रमं पित्तरुजं तथैव ।
रूपं सुखं वीर्यबलं निहन्ति तस्माद्विशुद्धो विनियोजनीयः ।। (Āy. Pra. 2/18)

Administration of 'aśuddha gandhaka' causes skin diseases, increase in body temperature, giddiness and diseases of pitta doṣa. It adversely affects the body radiance, overall health and virility. Therefore, proper purification of 'gandhaka' becomes most essential before using it for therapeutic purposes.

- Aśuddha gandhaka doṣa as per 'Rasataraṅgiṇī' (8/5-6):

By consuming the impure or improperly purified gandhaka, there will be steep rise in body temperature resulting in 'citta-vyākulatā' (delirium) and 'rakta vikṛtijanya roga' (diseases of pitta and rakta doṣa). It ruins the calmness of the mind (mana-prasannatā), physical appearance (surūpatā), body radiance (prabhā), physical strength (bala). Therefore, the sulphur is always purified and used for all the therapeutic purposes.

### Gandhaka śodhana- 1st method:

पयःस्विन्नो घटीमात्रं वारिधौतो हि गन्धकः । गव्याज्यविद्रुतो वस्त्राद् गलितः शुद्धिमृच्छति ।।
(R. R. S. 3/20)

In a wide mouthed, clean stainless steel vessel, required quantity of warm cow's milk is taken. The mouth of the vessel is covered and tied with a white and thin cloth.

Meanwhile a clean stainless steel vessel or a bigger sized tablespoon is taken. It is filled with desired quantity of ghee (minimum of 1/4th quantity or equal to that of sulphur) and held over fire. When ghee is hot, the same quantity of powdered 'aśuddha gandhaka' is poured into it. As the sulphur starts to melt, the mixture is stirred continuously with a smaller spoon.

When sulphur melts completely, it is carefully poured into the vessel containing milk through the cloth. Soon after pouring, the molten sulphur is filtered through the cloth and will be deposited at the bottom of the vessel in the milk as solidified sulphur. (Note: This process of melting and pouring may be repeated for 3 to 7 times for better purification)

Now the cloth on the vessel is removed and the vessel with milk and poured gandhaka is placed over mild fire and cooked for 1 ghaṭī (3 hours), which will be 'swedana' of gandhaka. Later, the sulphur is washed with warm water, powdered, dried and stored in suitable airtight container as 'śuddha gandhaka'.

Note:

1. Only mild heat should be used here to carry out the procedure. If the heating process is carried out on LPG stoves, only mild heat has to be maintained by keeping the regulator to minimum level.
2. Moreover, only mild heat is enough to melt sulphur. If high flame is used, the sulphur easily catches fire and burns. If burnt, it attains blackish shade.
3. Once the sulphur melts, the mixture needs continuous stirring, so that all parts of the molten sulphur receive the even temperature and does not catch fire.
4. The filtration through cloth helps in getting rid of any physical impurities in the sulphur.
5. The milk in the vessel should be warm, not cold; because, if the molten sulphur is poured into cold milk, the milk and the ghee enter into the cavities of sulphur and later it becomes difficult to wash it even with warm water.
6. With each attempt of melting and pouring of sulphur into the vessel containing milk and ghee, the purified sulphur should attain an attractive bright yellow colour.
7. As the sulphur is exposed to both ghee and milk in the process, the fat soluble as well as water-soluble impurities of sulphur will be effectively removed.
8. Out of many methods explained for purification of sulphur, this method is widely accepted and followed by majority of pharmaceutical companies.

**Gandhaka śodhana- 2nd method:**

गन्धको द्रावितो भृङ्गरसे क्षिप्तो विशुध्यति । तद्रसः सप्तधा स्वित्रो गन्धकः परिशुध्यति ।।
(R. R. S. 3/23)

The un-purified sulphur is powdered and taken in an iron vessel. It is heated over mild fire with frequent stirring to melt the sulphur completely. Later the molten sulphur is poured on the thin cloth tied over a wide mouthed vessel containing enough quantity of 'bhṛṅgarāja swarasa' (quantity enough to submerge the sulphur).

The sulphur deposited at the base of the vessel in 'bhṛṅgarāja swarasa' is collected. It is melted again and similarly poured into fresh 'bhṛṅgarāja swarasa'. This process is repeated for 7 times. At the end, the sulphur is washed with warm water, dried and stored in suitable airtight containers as śuddha gandhaka (purified sulphur). The sulphur purified with this method may be used for all its compound formulations (Find similar reference in R. T. 8/21-22).

### Gandhaka śodhana- 3rd method:

लोहपात्रे विनिधिष्य घृतमग्नौ प्रतापयेत् । तप्ते घृते समानं तु धिपेद्गन्धकजं रजः ।।
विद्रुतं गन्धकं ज्ञात्वा तनुवस्त्रे विनिधिपेत् । यथा वस्त्राद्विनिःसृत्य दुग्धमध्येऽखिलं पतेत् ।।
शीतो निष्कासितो धौतो जलं वस्त्रेण शोषयेत् । एवं नैर्मल्यमापन्नो गन्धकः शुद्ध उच्यते ।।
एवं वारत्रयं शोध्यो भिन्ने दुग्धे प्रयत्नतः । भधणर्थं हि भिषजा योगार्थं सकृदेव च ।।

(Ā. Pra. 2/21-24)

In a clean wide mouthed iron vessel (kaḍhai), required quantity of 'ghee' is taken. The vessel is placed over mild fire and heated. When the ghee melts, it is added with equal quantity of un-purified sulphur in powder form and stirred.

Meanwhile in a stainless steel vessel, required quantity of warm cow's milk is taken. The mouth of the vessel is covered and tied with a white and thin cloth. Now the molten sulphur is carefully poured into this vessel through the cloth.

Soon after pouring, the molten sulphur is filtered through the cloth and will be deposited at the bottom of the vessel in the cold milk as solidified sulphur.

This process of melting with ghee and pouring in a the vessel containing milk through a cloth is repeated for 3 times.

Later the sulphur is collected from the vessel and washed with warm water to remove 'snigdhāmśa' of ghee and milk. It is wiped, powdered, dried and stored in suitable airtight container as 'śuddha gandhaka'.

Note: Repetition of the process for 3 times is required only when the purified sulphur is used for internal administration. However, to obtain 'śuddha gandhaka' for pharmaceutical purposes, the above said process can be done only once.

### Gandhaka śodhana- 4th method:

खल्वे सौगन्धिकं क्षिप्त्वा दृढं सम्पेषयेत्ततः । श्लक्ष्णचूर्णं ततो ज्ञात्वा चतुष्पलमितं बलिम् ।।
यन्त्रे डमरुसंज्ञे च पचेद्यामचतुष्टयम् । ऊर्ध्वलग्नं बलिं पीतं यत्नतो ह्यवतारयेत् ।।
एवं संशोधितो गन्धः शुद्धिमायात्यनुत्तमाम् । पाषाणादिकदोषांश्च सर्वथा विजहात्ययम् ।।

(R. T. 8/23-25)

The four pala (200 gms) of un-purified sulphur is triturated in a clean khalva yantra. The fine powder of the same is taken in a 'ḍamaru yantra' and subjected for 4 prahara (12 hours) of moderate heat (madhyamāgni).

When cool on its own, the yantra is carefully unsealed and the sulphur adhered at the base of the upper pot in droplet format is neatly collected. This bright yellow purified sulphur is considered as 'viśeṣa śodhita gandhaka' (specially purified sulphur) for two reasons given below;

1. The sulphur in this method rises up in vapour form and adheres at the base of upper pot; so, there is no chance for any physical impurities to prevail in it.
2. The purified sulphur here, remains free from 'snigdhāṁśa' or 'fragrance' of milk, ghee, oil or any other liquid preparations as seen in other methods.

**Śuddha gandhaka- dosage:**

रक्तिकातः समारभ्य रक्तिकाष्टकसंमितम् । प्राणाचार्यः प्रयुञ्जीत गन्धकं तु विशोधितम् ॥
(R. T. 8/39)

The general dosage of purified sulphur is from 1 rattī (125 mgs) to 8 rattī (1000 mgs or 1 gram). However, before its administration, all the factors that influence the dosage are to be very carefully assessed and only later, the dose is finalized.

**Śuddha gandhaka- properties:**

गन्धाश्मातिरसायनः सुमधुरः पाके कटूष्णो मतः । कण्डूकुष्ठविसर्पदद्रुदलनो दीप्तानलः पाचनः ॥
आमोन्मोचनशोषणो विषहरः सूतेन्द्रवीर्यप्रदः । गौरीपुष्पभवस्तथा कृमिहरः सत्त्वात्मकः सूतजित्॥
(R. R. S. 3/16)

Śuddha gandhaka is a good rejuvenator. It possesses madhura rasa, kaṭu vipāka and uṣṇa vīrya. It is indicated in kaṇḍū (itching), kuṣṭha (skin diseases), visarpa (herpes zoster) and dadru (skin disease). It improves the appetite and is a good digestive.

It digests āma doṣa and exhibits the action of śoṣaṇa. It nullifies the influence of 'gara-viṣa' on the body. It renders additional potency to 'pārada' and is a good kṛmihara.

- Another reference:

शुद्धगन्धो हरेद्रोगान् कुष्ठमृत्युजरादिकान् । अग्निकारी महानुष्णो वीर्यवृद्धिं करोति च ॥
(R. R. S. 3/45)

Śuddha gandhaka is indicated in all types of kuṣṭha roga. Its sensible administration can delay the aging process and death. It is useful in conditions of fever. It improves the appetite and possesses uṣṇa vīrya. Its judiciously use can improve the virility of the person.

- Another reference:

> गन्धः शुद्धो गर-विषहरः क्षुद्रकुष्ठेभसिंहः कासं श्वासं हरति नितरां दद्रुदावानलश्च ।
> आधिव्याधिप्रशमनपटुः काममामं निहन्यात् दिव्यां दृष्टिं वितरतितरां जाठराग्निं प्रसूते ॥
> सुगन्धिकः सुनिर्मलः सरो रसायनोत्तमः । कटूष्णवीर्यपाचनो रसेन्द्रवीर्यवर्द्धनः ॥
> विकारान्नाशयत्याशु दुष्टसूताशनोत्थितान् । दुष्टाहिभक्षणोत्थांश्च शिरोदाहादिकानपि ॥
> (R. T. 8/36-38)

The properly purified sulphur, when used in suitable dosage will nullify all the influence of 'gara-viṣa' on the body. It cures all 13 types of 'kṣudra-kuṣṭha' (minor skin ailments), kāsa (cough) and śwāsa (dyspnoea). It is like wild fire (dāvānala) in destroying 'dadru roga' (a skin disease). It is beneficial in all types of mental and physical ailments and is good at mitigating āma doṣa.

Purified sulphur when consumed for many days with suitable adjuvant will provide good eyesight and considerably improves the digestive powder. It is a good 'rasāyana'. It possesses 'kaṭu' rasa, 'uṣṇa' vīrya and 'pācaka' guṇa. By its use in any mercury compound, the strength of mercury improves. It acts as antidote in combating the toxic effects of mercury like 'śirodāha' (burning sensation in head), 'āntra-śūla' (abdominal pain) etc.

Note: Purified sulphur is also beneficial in many more diseases when judiciously used. It is also antidote for 'nāga viṣa' (lead toxicity).

**Gandhaka toxicity- antidote:**

> विकारो यदि जायेत गन्धकाच्चेत्तदा पिबेत् । गोघृतेनान्वितं क्षीरं सुखी स्यात् स च मानुषः ॥
> (Bṛ. R. Rā. Su.)

In case of any toxicity induced because of 'śuddha gandhaka' administration, the person should be advised to consume 'warm milk' added with little quantity of 'ghee' for few days or until the toxicity symptoms come down. This measure acts as a good antidote to sulphur toxicity.

**Gandhaka sevana- pathya:**

> जाङ्गलानि तु मांसानि छागलानि प्रयोजयेत् । (Āy. Pra. 2/49)

The cooked meat of wild animals and birds; and the cooked meat of goat are advised as a part of special diet to the persons consuming 'śuddha gandhaka' for therapeutic purposes.

**Gandhaka sevana- apathya:**

> लवणाम्लानि शाकानि द्विदलानि तथैव च । स्त्रियश्चारोहणं यानं तदा चैतानि वर्जयेत् ॥
> **(Āy. Pra. 2/49)**

Intake of excessive salt, sour foods, green leafy vegetables and dicotyledons; excessive indulgence in sex and long journeys should be strictly avoided by the persons consuming 'śuddha gandhaka' for therapeutic purposes.

- Another reference:

क्षाराम्लतैलसौवीरविदाहिद्विदलं तथा । शुद्धगन्धकसेवायां त्याज्यं योगयुतेन हि ।। (R. R. S. 3/36)

Excessive intake of alkaline, sour, oily, acidic and spicy foods and excessive use of dicotyledons should be strictly avoided by the persons consuming 'śuddha gandhaka' for therapeutic purposes.

**Gandhaka- few compound formulations:**

1. Rasaparpaṭī
2. Pañcāmṛta parpaṭī
3. Rasasindūra
4. Gandhaka rasāyana
5. Gandhakādya malahara

**Gandhaka rasāyana:**

शुद्धो बलिर्गोपयसा त्रिवारं ततश्चतुर्जातगुडूचिकाद्भिः ।
पथ्याक्षधात्र्यौषध भृङ्गनीरैर्भाव्योऽष्टवारं पृथगार्द्रकेण ।।
सिद्धे सितां योजयेत् तुल्यभागां रसायनं गन्धकसंज्ञितं स्यात् ।
धातुक्षयं मेहगणाग्निमान्द्यं शूलं तथा कोष्ठगतांश्च रोगान् ।।
कुष्ठान्यथाष्टादशरोगसंघान्निवारयत्येव च राजरोगम् ।
कर्षोन्मिते सेवित मेति मर्त्यो वीर्यं च पुष्टिं बलमग्निदीप्तिम् ।। (Āy. Pra. 2/46-48)

One kg of 'śuddha gandhaka' is taken in a clean khalva yantra and triturated to fine powder form. It is subjected for 3 bhāvanās with 'godugdha'. Later the drug is subjected for 8 bhāvanā each with following liquids; 1. Twak kwātha 2. Sūkṣma elā hima 3. Tejapatra kwātha 4. Nāgakeśara kwātha 5. Guḍūcī kwātha 6. Harītakī kwātha 7. Bibhītakī kwātha 8. Āmalakī kwātha 9. Śuṇṭhī kwātha and 10. Bhṛṅgarāja swarasa respectively.

At the end when the drug material is completely dry, it should be added with same quantity of sugar and stored in airtight container for further use.

Note: One bhāvanā usually takes a day and the time taken for the complete processing of this formulation will be 83 days, which is quite a long time. Usually pharmaceutical companies employ the electrical grinder for the purpose of preparing this formulation and the grinder is run all through these many days with different liquids mentioned above.

This formulation is one among the largest prescribed medicines in Āyurveda

dr.keshav_raj

treatment. All most all the pharmaceutical companies market this formulation. However, it is marketed in the form of tablets or pills (250 to 300 mgs) with appropriate packing instead of powder form.

Before administering this formulation for rasāyana purpose, it is advised to go for dehaśuddhi (body purification) with appropriate vamana and virecana to garner full therapeutic benefits out of the treatment.

**Dosage, adjuvant and therapeutic utility:**

One karṣa (12 gms) per day in divided doses or in the calibrated dosage along with warm water or honey. It is a known rasāyana. It improves the virility, nourishes body and improves physical strength and appetite. It is indicated in dhātukṣaya, all types of prameha, agnimāndya, śūla, koṣṭagata roga, all types of kuṣṭha, and kṣayaroga.

- Pathya: During the course of treatment patient is encouraged to take more of jāṅgama māṁsa and ajamāṁsa.
- Apathya: Lavaṇa, amla, śāka varga, dvidala dhānya viśeśa and strī-saṅga (sex) are to be avoided during treatment period.

**Gandhakādya malahara:**

> सिक्थतैलं सुविमलं रसतालकसंमितम् । गन्धकं गिरिसिन्दूरं तोलकार्द्धमितं पृथक् ।।
> टङ्कणं घनसारं च पृथक् माषद्वयोन्मितम् । दत्वा सम्मेल्य यत्नेन काचकुप्यां निधापयेत् ।।
> मतो मलहरोऽयं तु गन्धकाद्यसमाह्वयः । विनाशयत्याशु भृशं पामामत्यर्थदारुणाम् ।।

(R. T. 8/63-65)

1. Siktha taila- 6 tola (72 gms) (rasa-tolaka); 2. Śuddha gandhaka- half tola (6 gms); 3. Śuddha giridsindūra- half tolā (6 gms); 4. Śuddha ṭaṅkaṇa- 2 māṣa (2 gms); and 5. Karpūra- 2 māṣa (2 gms); all the drugs are taken in specified ratio.

Siktha taila is taken in a clean stainless steel vessel placed over mild fire. When it liquefies, the vessel is taken out of fire and is added with the fine powders of all the remaining ingredients one by one and stirred homogenously. When cool on its own, the mixture attains the consistency of 'malahaṛa'.

It is later stored in suitable wide mouthed airtight containers as 'gandhakādya malahara' for further therapeutic use. Its daily application over the affected part of skin cures severe 'pāmā roga'.

**Gandhaka druti:**

कलांशव्योषसंयुक्तं गन्धकं श्लक्ष्णचूर्णितम् । अरत्निमात्रे वस्त्रे तद्विप्रकीर्य विवेष्ट्य तत् ।।
सूत्रेण वेष्टयित्वाऽथ यामं तैले निमज्जयेत् । धृत्वा संदंशतो वर्तिमध्यं प्रज्वालयेच्च तम् ।।
द्रुतो निपतितो गन्धो बिन्दुशः काचभाजने ।
(R. R. S. 3/27-29)

One clean silk cloth of one square ‘aratni’ (distance between elbow joint and little fingertip) (16.5 inches or 41.91cm) is taken. It is spread out on a clean surface and over that the mixture of śuddha gandhaka cūrṇa (1 part) and trikaṭu cūrṇa (1/16th part) is evenly spread.

This cloth is rolled like a wick and tied with a cotton thread on either ends and in the middle to avoid the spillage of the powder. This varti is kept immersed in ‘tila taila’ for one prahara (3 hours).

Later the wick is held in the middle with a ‘sandaṁśa yantra’, lifted from the oil and ignited from one end. The drops of oil that trickle down from burning varti are collected in a vessel placed beneath. This thick and blackish oil is later stored in suitable airtight container as ‘gandhaka dṛti’.

Note: With the method explained above, it is difficult to prepare ‘gandhaka druti’ in larger quantities. For that ‘śuddha gandhaka’ and ‘tila taila’ are taken in a clean stainless steel vessel in 1: 16 ratio. The vessel is placed over mild fire and cooked until all the gandhaka dissolves in oil and the mixture attains little thicker consistency.

Later, when self-cool, this oil is stored in airtight containers as ‘gandhaka druti’. Here, the tila taila may be replaced with any other edible oil (coconut oil, sarṣapa taila, nimba taila etc). Dṛti prepared with any of these oils will be useful in the treatment of skin diseases.

**Gandhaka druti- therapeutic utility:**

तां द्रुति प्रक्षिपेत्पत्रे नागवल्यास्त्रिबिन्दुकाम् । वल्लेन प्रमितं स्वच्छं सूतेन्द्रं च विमर्दयेत् ।।
अङ्गुल्याऽथ सपत्रां तां द्रुतिं सूतं च भक्षयेत् । करोति दीपनं तीव्रं क्षयं पाण्डुं च नाशयेत् ।।
कासं श्वासं च शूलार्तिं ग्रहणीमतिदुर्धराम् । आमं विनाशयत्याशु लघुत्वं प्रकरोति च ।।
(R. R. S. 3/29-31)

Three drops of ‘gandhaka druti’ along with one valla (3 rattī or 375 mgs) of ‘śuddha pārada’ are taken over a ‘betel leaf’ (nāgavallī patra). Both the drugs on the leaf are rubbed well and eaten daily.

This medicine improves the appetite and is indicated in kṣaya roga, pāṇḍu roga, kāsa, śwāsa, śūla, grahaṇī roga and āma doṣa. It brings lightness in the body.

## 2. GAIRIKA

(Haematite)

### Introduction:

Gairika is the second mineral drug of uparasa group. It is identified as mineral 'Haematite' or 'Ochre'. Haematite is the mineral form of iron oxide ($Fe_2O_3$), one of several iron oxides. It is colored black to steel or silver-grey, brown to reddish brown, or red. It is mined as the main ore of iron.

Varieties include 'kidney ore', 'martite' (pseudomorphs after magnetite), 'iron rose' and 'specularite' (specular hematite). While the forms of hematite vary, they all have a rust-red streak. Hematite is harder than pure iron, but much more brittle.

Huge deposits of hematite are found in banded iron formations. Grey hematite is typically found in places where there has been standing water or mineral hot springs, such as those in 'Yellowstone National Park' in the United States. The mineral can precipitate out of water and collect in layers at the bottom of a lake, spring, or other standing water. Hematite can also occur without water, however, usually as a result of volcanic activity.

Clay-sized hematite crystals can also occur as a secondary mineral formed by weathering processes in soil, and along with other iron oxides or oxyhydroxides such as goethite, is responsible for the red color of many tropical, ancient or otherwise highly weathered soils.

### Occurrence:

This mineral is found in all parts of India. Bihar state is known for its mines.

### Properties:

| | |
|---|---|
| Identified as | Hematite |
| Chemical name | Iron oxide or Ferrus oxide |
| Chemical formula | $Fe_2O_3$ |
| Colour | Black to steel or silver-grey, brown to reddish brown, or red |
| Hardness | Harder than pure iron, but much more brittle |
| Hardness | 5.5 to 6.5 |
| Specific gravity | 4.9 to 5.3 |
| Solubility | Insoluble in water |

### Gairika- synonyms:

गैरिकं त्वथ गैरेयं, गिरिमृद् गिरिमृत्तिका । रक्तधातुर्लोहधातुस्तदेव गिरिमृद्भवम् ।। (R. T. 22/110)

Gaireya, girimṛd, girimṛttikā, raktadhātu, lohadhātu and girimṛdbhava; all these are the synonymous words found in classics for 'gairika' (heamatite).

### Gairika- brief history:

This mineral is in therapeutic use since 'Caraka Saṁhitā' period. Books of 'Rasaśāstra' have counted this drug under 'uparasa' group. It is one among the chief ores of iron.

### Gairika- types:

| Acc to R.T./R. R. S. | Acc to Āyurveda prakāśa | Acc to Rasārṇava |
|---|---|---|
| 1. Pāṣāṇa gairika<br>(Rūkṣa, kaṭhina with tāmra varṇa)<br>2. Swarṇa gairika<br>(Snigdha, masṛṇa with śoṇita varṇa) | 1. Swarṇa gairika<br>2. Sāmānya gairika<br>3. Pāṣāṇa gairika | 1. Rakta gairika<br>2. Hema gairika<br>3. Kevala gairika |

- References:

गैरिकं तु समाख्यातं द्विविधं रसकोविदैः । पाषाणगैरिकं त्वाद्यं द्वितीयं स्वर्णगैरिकम् ।।
(R. T. 22/111)

पाषाणगैरिकं चैकं द्वितीयं स्वर्णगैरिकम् । पाषाणगैरिकं प्रोक्तं कठिनं ताम्रवर्णकम् ।।
अत्यन्त शोणितं स्निग्धं मसृणं स्वर्णगैरिकम् ।। (R. R. S. 3/46-47)

द्विविधं गैरिकं प्राहुः स्वर्णं सामान्यगैरिकम् । परैस्तृतीयमाप्युक्तं पाषाणाख्यं हि गैरिकम् ।।
(Āy. Pra. 2/238-239)

गैरिकं त्रिविधं रक्तहेमकेवलभेदतः ।। (Rasārṇava 7/83)

### Gairika- swarūpa and grāhyatwa:

स्वर्णगैरिकं स्निग्धं मसृणं त्वतिकोमलम् । पाषाणगैरिकं रूक्षं कठिनं नातिलोहितम् ।।
पाषाणगैरिकात् श्रेष्ठं कथितं स्वर्णगैरिकम् । अतः सर्वत्र मतिमान् योजयेत्स्वर्णगैरिकम् ।।
(R. T. 22/112-113)

Out of the above said two types of 'gairika', 'swarṇa gairika' will be snigdha, masṛṇa and very soft. Whereas the 'pāṣāṇa gairika' will be rūkṣya (rough), kaṭhina (hard) and will have pale red colour.

In comparison with 'pāṣāṇa gairika', 'swarṇa gairika' is considered 'śreṣṭha'. Therefore, for all pharmaceutical as well as therapeutic purposes, it is always better to use 'swarṇa gairika'.

### Gairika śodhana- 1st method:

गैरिकं तु गवां दुग्धैर्भावितं शुद्धिमृच्छति ।
(R. R. S. 3/49)

Required quantity of 'swarṇa gairika' is taken in a clean khalva yantra and triturated to obtain it in fine powder form. This powder is subjected to one bhāvanā with 'cow's milk' and the dry powder obtained is stored as 'śuddha gairika' for further pharmaceutical use.

### Gairika śodhana- 2nd method:

गैरिकं किञ्चिदाज्येन भृष्टं शुद्धं प्रजायते । (R. R. S. 3/49)
गव्याज्येन तु संभृष्ठं यत्नतो मन्दवह्निना । सुवर्णगैरिकं शीघ्रं शुद्धिमाप्नोत्यसंशयम् ।।
(R. T. 22/115)

The fine powder of 'swarṇa gairika' is taken in a clean 'kaḍhāhī' (iron vessel) placed over mild fire. It is added with needed quantity of 'ghee' and fried properly. The dry powder obtained at the end is stored as 'śuddha gairika' for further pharmaceutical use.

### Gairika- properties:

सुवर्णगैरिकं स्निग्धं मधुरं शिशिरं परम् । तुवरं तापहरणं हिक्कावमिनिवारणम् ।।
रक्तपित्तप्रशमनं तथासृग्दरनाशनम् । विषापहं तथा बल्यं मतं लोचनयोर्हितम् ।।
उदर्दकण्डूशमनं तथैव व्रणरोपणम् । ज्वरघ्नं च विशेषेण वह्निदाहनिबर्हणम् ।।(R. T. 22/116-118)

Śuddha 'swarṇa gairika' possesses 'snigdha' and 'śīta' guṇa; 'madhura' and 'kaṣāya' rasa. Its use reduces the influence of high atmospheric temperature. It is indicated in 'hikkā' (hiccup), vamana (chardi), raktapitta and raktapradara.

It nullifies the influence of poisons within the body. It improves the physical strength and is useful in all eye diseases. It is used as a topical medicine in 'udarda' and 'kaṇḍū'. It is good at healing the wounds when used for external application in suitable dosage form (malahara). As topical medicine, it is useful in 'pittaja jwara' and in 'burn wounds'.

### Gairika- dosage:

द्विगुञ्जतः समारभ्य चतुर्गुञ्जमितं परम् । सुवर्णगैरिकं शुद्धं युञ्जीत भिषजां वरः ।।
(R. T. 22/119)

Two rattī (250 mgs) to four rattī (500 mgs) is the general dosage of 'śuddha swarṇa gairika'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

### Gairika- few compound formulations:

1. Puṣyānuga cūrṇa
2. Pradarāntaka louha
3. Irimedādi taila
4. Jātyādi taila
5. Gairikādya malahara

**Gairikādya malahara:**

> सुवर्णगैरिकं शुद्धं तोलकैकमितं शुभम् । तन्मितां रजनीञ्चैव माषकं भालभूषणम् ॥
> सिक्थतैलं च विमलं कर्षत्रितयसंमितम् । संपेष्य खलु यत्नेन काचकुप्यां तु विन्यसेत् ॥
> गैरिकाद्यो मलहरो नामतः परिकीर्तितः । कण्डूदाहप्रशमनो विविधव्रणरोपणः ॥
>
> (R. T. 22/130-132)

1. Śuddha swarṇa gairika- 1 tola (12 gms); 2. Haridrā cūrṇa- 1 tola (12 gms); 3. Sindūra- 1 māṣa (1 gm); and 4. Siktha taila- 3 karṣa or tola (36 gms); all these drugs are taken in the specified ratio.

Specified quantity of 'siktha taila' is taken in a clean stainless steel vessel placed over mild fire. When all the 'siktha taila' melts, the fire is put off and the remaining powders are added one by one and stirred homogenously.

When cool on its own, the mixture attains 'malahara' (ointment) form. It is later stored in suitable wide mouthed airtight container as 'gairikādya malahara' for further therapeutic use.

When used for topical application, this medicine is useful in curing 'kaṇḍū' (itching) associated with many skin ailments. It is also useful in healing the wounds.

## 3. KĀSĪSA

(Green vitriol; Ferrous sulphate; $FeSO_4$)

**Introduction:**

Kāsīsa (Green vitriol) is the third mineral drug of uparasa group. It is identified as iron sulphate or ferrous sulphate. Iron sulphate is the chemical compound with the formula $FeSO_4$. Known since ancient times as **copperas** and as green vitriol, the blue-green heptahydrate is the most common form of this material. All iron sulphates dissolve in water to give the same aquo complex $[Fe(H_2O)_6]^{2+}$, which has octahedral molecular geometry and is paramagnetic. Together with other iron compounds, ferrous sulphate is used to fortify foods and to treat iron-deficiency anaemia. Constipation is a frequent and uncomfortable side effect associated with the administration of oral iron supplements. Stool softeners often are prescribed to prevent constipation.

**Occurrence:**

The regions of Bihar, Orissa, Punjab and Uttar Pradesh are the rich sources of 'kāsīsa' (green vitriol). Iron sulphate can be found in various states of hydration and several of these forms exist in nature;

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- $FeSO_4.H_2O$ (mineral: szomolnokite, relatively rare)
- $FeSO_4.4H_2O$ (mineral: rozenite, white, relatively common, may be dehydration product of melanterite)
- $FeSO_4.5H_2O$ (mineral: siderotil, relatively rare)
- $FeSO_4.6H_2O$ (mineral: ferrohexahydrite, relatively rare)
- $FeSO_4.7H_2O$ (mineral: melanterite, blue-green, relatively common)

**Properties:**

| | |
|---|---|
| Identified as | Green vitriol |
| Chemical name | Ferrous sulphate; |
| Chemical formula | $FeSO_4$ |
| Solubility | Dissolve in water to give the same aquo complex $[Fe(H_2O)_6]^{2+}$ |
| Used to | Fortify foods and to treat iron-deficiency anaemia |

**Kāsīsa- synonyms:**

काशीशकञ्च कासीसं पुष्पकासीसकन्तथा । पांशुकं पांशुकासीसं खगाख्यञ्च प्रकीर्तितम् ।।

(R. T. 21/227)

Kāśīśaka, kāsīsa, puṣpakāsīsa, pāṁśuka, pāṁśukāsīsa, khaga (bird); all these are the synonymous words used in the classics for 'kāsīsa' (iron sulphate or ferrous sulphate).

**Kāsīsa- brief history:**

This mineral is in therapeutic use since 'Caraka Saṁhitā' period. Books of 'Rasaśāstra' have counted this drug under 'uparasa' group. It is one among the chief ores of iron. It goes as an ingredient in more than 100 formulations presently used in Āyurvedic treatment. Its solution was used as ink to write on papers during olden days.

**Kāsīsa- types:**

| **Acc to R. T.** | **Acc to R. R. S.** | **Acc to Āyurveda Prakāśa** | **Acc to Rasārṇava** | **Acc to Ānanda-kanda** |
|---|---|---|---|---|
| 1. Cūrṇa kāsīsa<br>2. Puṣpa kāsīsa | 1. Bālukā kāsīsa<br>2. Puṣpa kāsīsa | 1. Kāsīsa<br>2. Dhātu kāsīsa<br>3. Puṣpa kāsīsa | 1. Śukla kāsīsa<br>2. Kṛṣṇa kāsīsa<br>3. Pīta kāsīsa | 1. Pīta kāsīsa<br>2. Kṛṣṇa kāsīsa<br>3. Sita kāsīsa<br>4. Rakta kāsīsa |

- References:

चूर्णकासीसकञ्चैव पुष्पकासीसकन्तथा। कासीसं द्विविधं ख्यातं रसतन्त्रप्रणेतृभिः ।। (R. T. 21/228)
(R. R. S. 3/51)
कासीसं बालुकाद्येकं पुष्पपूर्वमथापरम् ।
कासीसं धातुकासीसं पांशुकासीसमित्यपि । किञ्चित्तदेव पीतं तु पुष्पकासीसमुच्यते ।।
(Āy. Pra. 2/273)

(Rasārṇava 7/81)
कासीसं त्रिविधं शुक्लं कृष्णं पीतमिति प्रिये ।
(Ānandakanda)
पीतं कृष्णं सितं रक्तं चतुर्धेति परे जगुः ।

**Kāsīsa- swarūpa:**

चूर्णकासीसकं श्वेतमीषत्पीतञ्च कीर्तितम् । पुष्पकासीसकं स्वच्छहरिद्वर्णं प्रकीर्तितम् ।।
(R. T. 21/229)

Out of the above said two types of 'kāsīsa', the 'cūrṇa kāsīsa' will have whitish or yellowish in colour. Whereas, the second variety 'puṣpakāsīsa' possesses greenish colour.

Note: The market sample of 'kāsīsa' presently used by all the pharmaceutical companies comes in green coloured granular form. Because of its granular form, it might have been called as 'cūrṇa kāsīsa', 'bālukā kāsīsa' or 'dhātu kāsīsa'.

This mineral when is exposed to atmospheric conditions for long, it attains yellowish shade. In this stage, perhaps the mineral was called as 'puṣpa kāsīsa'.

**Kāsīsa- śodhana- 1st method:**

सकृद्भृङ्गाम्बुना क्लिन्नं कासीसं निर्मलं भवेत् ।। (R. R. S. 3/54)

Aśuddha kāsīsa is poured into a vessel containing enough quantity of 'bhṛṅgarāja swarasa', stirred once and decanted. The kāsīsa powder in the vessel is dried and stored as 'śuddha kāsīsa'.

**Kāsīsa- śodhana- 2nd method:**

सकृद्भृङ्गाम्बुना स्विन्नं कासीसं निर्मलं भवेत् ।। (Āy. Pra. 2/275)
कासीसं भृङ्गराजोत्थवारिणि घटिकात्रयम् । सकृत् स्विन्नं प्रयत्नेन शुद्धिमायात्यनुत्तमाम् ।।
(R. T. 21/230)

The granules of 'kāsīsa' are tied in a cloth like 'poṭṭalī', hung in a 'dolāyantra' containing 'bhṛṅgarāja swarasa as liquid media and subjected for 3 hours of swedana. During this time, the 'kāsīsa' dissolves in the liquid and gets collected at the base of the 'dolāyantra'.

Now the 'poṭṭalī' is removed from the pot and the liquid is allowed to cool on its own. Later the supernatant liquid is decanted and the 'kāsīsa' sediment at the base is collected, dried under sun and stored in suitable airtight container as 'śuddha kāsīsa' for further pharmaceutical use.

**Kāsīsa- śodhana- 3rd method:**

कासीसं शुद्धिमाप्नोति पित्तैश्च रजसा स्त्रियः ।। (R. R. S. 3/45)

Aśuddha kāsīsa is immersed once into 'pitta' of animals or the 'rajas' of women. Later it is dried and stored as 'śuddha kāsīsa'.

**Kāsisa māraṇa- 1st method:**

काञ्जिकेन तु विभाव्य सप्तधा शोषयेत्खगमिनांशुभिर्बुधः ।
सम्पुटेच्च लघुना पुटेन तत् स्याद्धि भस्म खलु लोहितप्रभम् ।।
समादायाथ तद्भस्म पेषयेन्निम्बुकद्रवैः । चक्रिकाः कारयित्वा च पुटेल्लघुपुटे पुनः ।।
यावन्निरम्लं तद्भस्म तावदेवं पुनः पुनः । निम्बूकोत्थै रसैर्वैद्यः पिष्ट्वा संशोष्य सम्पुटेत् ।।
सुश्लक्ष्णं जायते भस्म सर्वदोषविवर्जितम् । तत्साध्येषु विकारेषु वीतशङ्कः प्रयोजयेत् ।।
(R. T. 21/255-258)

Required quantity of 'śuddha kāsīsa cūrṇa' is taken in a clean khalva yantra and subjected for seven bhāvanās with 'kāñjī'. The dry powder obtained after 7th bhāvanā is enclosed in 'śarāva sampuṭa' and subjected for one 'laghu puṭa'.

When cool on its own, the reddish kāsīsa bhasma obtained from the 'sampuṭa' is triturated thoroughly with 'nimbū swarasa' to prepare the 'cakrikās' (pellets) of even size and shape. The pellets are dried, enclosed in 'śarāva sampuṭa' and subjected for another 'laghu puṭa'.

In this manner, more than one 'laghu puṭa' is given by triturating with 'nimbū swarasa' until the bhasma prepared is free from amlatwa (sore taste). Through this incineration method, the soft and fine 'kāsīsa bhasma' may be obtained.

**Kāsisa māraṇa- 2nd method:**

स्नुहीपत्ररसैर्यद्वा मर्दितं पुटितं मुहुः । निरम्लीभावपर्यन्तं कासीसं भस्मतामियात् ।। (R. T. 21/259)

Required quantity of 'śuddha kāsīsa cūrṇa' is taken in a clean khalva yantra and triturated thoroughly with 'snuhī patra swarasa' to prepare the 'cakrikās' (pellets) of even size and shape. The pellets are dried, enclosed in 'śarāva sampuṭa' and subjected for another 'laghu puṭa'.

In this manner, more than one 'laghu puṭa' is given by triturating with 'snuhī patra swarasa' until the bhasma prepared is free from amlatwa (sore taste).

Through this incineration method, the soft and fine 'kāsīsa bhasma' may be obtained.

**Kāsīsa bhasma- properties:**

> कासीसद्वयमम्लोष्णं तिक्तं च तुवरं तथा । वातश्लेष्महरं केश्यं नेत्र्यं कण्डूविषप्रणुत् ।।
> मूत्रकृच्छ्राश्मरीश्वित्रनाशनं परिकीर्तितम् ।। (Āy. Pra. 2/274-275)

Kāsīsa bhasma (of both cūrṇa kāsīsa and puṣpa kāsīsa) possesses amla, tikta, kaṣāya rasa and uṣṇa vīrya. It mitigates vitiated vāta and kapha doṣa. It is keśarañjaka, netrya (used in eye diseases), kaṇḍūghna and viṣaghna. It is indicated in mūtrakṛchra, aśmarī and 'świtra kuṣṭha'.

- Another reference:

> कासीसं तुवरं ग्राहि विपाकोष्णन्तु शीतलम् । श्वित्रघ्नं नेत्र्यमतुलं विषघ्नं कचरञ्जनम् ।।
> वातश्लेष्मामयहरं मूत्रकृच्छ्रप्रणाशनम् । कण्डूपाण्डुकृमिघ्नञ्च रक्तसञ्जननं परम् ।।
> रजःप्रवर्तकं बल्यं ज्वरघ्नं प्लीहनाशनम् । बाह्यप्रयोगे विज्ञेयं सङ्कोचनकरं परम् ।।
> (R. T. 21/231-233)

Śuddha kāsīsa possesses 'kaṣāya' (tuvara) rasa; grāhī guṇa; kaṭu vipāka and śīta vīrya. It is used for external application in 'świtra kuṣṭha' (vitiligo). It is useful in eye diseases. Its judicious internal administration induces 'vamana' and removes the toxins from the body.

Kāsīsa bhasma is used for preparing the hair dyes. It mitigates vāta and kapha doṣa. It is useful in mūtrakṛcchra, kaṇḍūroga and udarakṛmi. Its regular administration improves the haemoglobin percentage in the blood.

It normalizes the menstrual flow, improves physical strength, cures jīrṇa jwara and plīha roga. When used for external application, it possesses strong 'saṅkocaka' property.

**Kāsīsa bhasma- dosage:**

> गुञ्जार्द्धतः समारभ्य रक्तिकाद्वितयोन्मिता । कासीसकस्य कथिता पूर्णमात्रा भिषग्वरैः ।।
> (R. T. 21/242)

Half rattī (62 mgs) to two rattī (250 mgs) is the general dosage of properly prepared 'śuddha kāsīsa cūrṇa'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

**Kāsīsadrava- method of preparation:**

> सार्द्धद्वितोलकमिते सलिले तु परिस्नुते । पञ्चगुञ्जोन्मितं शुद्धं कासीसं निक्षिपेद् बुधः ।।
> विद्रुतं जायते शीघ्रं कासीसद्रव उत्तमः । (R. T. 21/240-241)

In 2.5 parts of 'distil water', five rattī (625 mgs) of 'kāsīsa cūrṇa' (ferrous

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sulphate prepared with above said method) is added. When the entire 'ferrous sulphate' dissolves in water, the liquid is stored in suitable airtight container as 'sajala kāsīsadrava'.

**Kāsīsadrava- properties:**

गुदभ्रंशविसर्पादिविविधामयनाशनः ।। (R. T. 21/241)

This 'sajala kāsīsadrāva' is used for external application with caution in 'gudabhraṁśa' (rectal prolapse), visarpa (herpes zoster) and other such diseases.

**Kāsīsa- sattvapātana:**

क्षाराम्लैर्मर्दिता ध्माता सत्त्वमुञ्चति निश्चितम् ।। (R. R. S. 3/65)

One part of 'śuddha kāsīsa' is taken in clean khalva yantra along with quarter part of 'yavakṣāra', 'ṭaṅkaṇa' and 'sarjakṣāra' together. The mixture is added with desired quantity of 'nimbū swarasa' to prepare the 'cakrikās' of desired size.

The cakrikās are dried, enclosed in suitable crucible and subjected for intense heat to obtain 'iron' as the sattva of kāsīsa.

**Kāsīsa- few compound formulations:**

1. Kāsīsādi guṭikā
2. Kāsīsādi taila
3. Rajaḥprvartinī vaṭī
4. Loha rasāyana
5. Świtrāri rasa
6. Pañcānana rasa

**Kāsīsa- artificial method of preparation:** (R. T. 21/234-239)

In a clean copper vessel, required quantity of 'loha cūrṇa' (Fe) is taken. It is added with smaller quantities of 'sajala gandhakadrāva'. Soon after adding, there will be intense reaction in the beaker with production of heat and froth. The addition of 'sajala gandhakadrāva' is continued little by little until all the 'loha cūrṇa' dissolves.

Later the solution is filtered through a 'filter paper'. The unfiltered 'dirt' on the filter paper is discarded and the filtrate (filtered liquid) is added with equal quantity of 'śuddha surā' (absolute alcohol).

Soon the 'kāsīsa cūrṇa' (Ferrous sulphate) is found deposited at the base of the vessel. Later, the supernatant liquid is decanted and the 'kāsīsa' powder sediment is dried under sun and stored. The 'kāsīsa' prepared like this, will be clean and dissolves completely in water in 2: 3 ratios (ferrous sulphate: water).

## 4. SPHAṬIKA

(Potash alum)

### Introduction:

Sphaṭika is the third mineral drug of uparasa group. It is identified as 'potash alum' in English. It is the potassium double sulphate of aluminium with chemical formula is $K_2SO_4$, $Al_2(SO_4)_3$, $24H_2O$

Potassium alum crystallizes in regular octahedra with flattened corners and is very soluble in water. The solution reddens litmus and is an astringent. When heated to nearly a red hot it gives a porous, friable mass, which is known as "burnt alum." It fuses at 92° C in its own water of crystallization.

"Neutral alum" is obtained by the addition of as much sodium carbonate to a solution of alum as will begin to cause the separation of alumina. Alum finds application as a mordant, in the preparation of lakes for sizing hand-made paper and in the clarifying of turbid liquids.

### Occurrence:

In India, the mineral is found in Sourāṣṭra (Gujarat), Punjab, Bihar, Goa, Uttar Pradesh and Nepal. It is also artificially prepared. Overseas, the ores are found in Italy, United States and in the island of Cebu (Philippines). Here it is locally known as tawas.

### Properties:

Potassium alum is an astringent/styptic and antiseptic. For this reason, it can be used as a natural deodorant by inhibiting the growth of the bacteria responsible for body odour. Use of mineral salts in such a fashion does not prevent perspiration. Its astringent/styptic properties are often employed after shaving and to reduce bleeding in minor cuts and abrasions, nosebleeds and haemorrhoids.

### Properties:

| | |
|---|---|
| Identified as | Potash alum |
| Chemical name | Potassium double sulphate of aluminium |
| Chemical formula | $K_2SO_4$, $Al_2(SO_4)_3$, $24H_2O$ |
| When heated red hot | It gives a porous, friable mass, which is known as "burnt alum. |
| It fuses | At 92° C in its own water of crystallization |
| Solubility | Easily soluble in water |
| Used as | An astringent and antiseptic. Often used after shaving to reduce bleeding in minor cuts and abrasions, nosebleeds and haemorrhoids. |

### Sphaṭika- source and the synonyms:

सौराष्ट्रदेशसम्भूता मृत्तिका तुवरी मता। सुराष्ट्रजा च सौराष्ट्री सैव सौराष्ट्रमृत्तिका।। (R. T. 11/177)

The mud obtained from 'Sourāṣṭra deśa' is called 'tuvarī'. Its synonyms are 'surāṣtrajā', 'sourāṣṭrī' and 'sourāṣṭra mṛttikā'. This sourāṣṭra mṛttikā (mud) is cleaned properly to obtain a clean, white coloured, lustrous mineral called 'sphaṭika'. It is used for therapeutic purposes after proper purification.

### Sphaṭika- synonyms:

स्फटिकारि: स्फुटी चैव स्फटिका स्फुटिकारिका ।
स्फुटिका फटिका चैव शुभ्रा कांक्षी च रङ्गदा ।।
दृढरङ्गा रङ्गदृढा तथैव दृढरङ्गदा । तुवरी रङ्गदात्री च कथिता भिषजां वरै: ।। (R. T. 11/178-179)

Sphaṭikāri, sphuṭī, sphaṭikā, sphuṭikārikā, sphuṭikā, phaṭikā, śubhrā, kāṅkṣī, raṅgadā, dṛḍharaṅgā, raṅgadṛḍhā, dṛḍharaṅgadā, tuvarī, raṅgadātrī; all these are the synonymous terms with which the drug is identified in the classics.

### Sphaṭika- brief history:

This mineral is in therapeutic use since 'Caraka Saṁhitā' period. Books of 'Rasaśāstra' have counted this drug under 'uparasa' group. It goes as an ingredient in many compound formulations of Āyurveda.

### Sphaṭika- types and grāhyatwa:

फटकी फुल्लिका चेति द्वितीया परिकीर्तिता ।। ईषत्पीता गुरुः स्निग्धा पीतिका विषनाशिनी ।
वृणकुष्ठहरा सर्वकुष्ठघ्नी च विशेषत: ।। निर्भारा शुभ्रवर्णा च स्निग्धा साम्लाऽपरा मता ।
सा फुल्लतुवरी प्रोक्ता लेपात्ताम्रं चरेदियम् ।। (R. R. S. 3/60-62)

There are two types of 'sphaṭika'; 1. Phaṭakī and 2. Phullikā. Out of these two 'phaṭakī' is light yellow in colour. It is heavy, soft and is good at nullifying the influence of poisons over body. It is useful in healing the wounds. It is indicated in all types of kuṣṭha roga. This variety is considered as 'grāhya sphaṭika' out of both.

The second one 'phullikā' is light weighted, bright white coloured, smooth and little sour tasting. Application of its paste over copper foils helps in the incineration of copper.

The other types of 'sphaṭika' are as provided below in tabular representation:

| Acc to R. R. S. | Acc to Rasendra Cūḍāmaṇi | Acc to Rasārṇava |
|---|---|---|
| 1. Phaṭakī<br>2. Phullikā | 1. Īṣatpīta<br>2. Śubhravarṇa | 1. Sita (khaṇḍa)<br>2. Kṛṣṇa (cūrṇa) |

### Sphaṭika śodhana- 1st method:

न दृष्टं शास्त्रतो लोका वह्नावुत्फुल्लयन्ति हि ।

(Āy. Pra. 2/258)

Required quantity of powdered 'aśuddha sphaṭika' is taken in a frying pan placed over moderate fire. The process of frying is continued with frequent stirring until all the water content in the drug evaporates. Later when the drug becomes brittle and light weighted, it is collected and stored as 'śuddha sphaṭika'.

Note: During the heating process, initially the 'sphaṭika' melts and attains gum like consistency. At this stage the frying process is continued. As the water content in the drug is lost, the particles of 'sphaṭika' swell up and become brittle and light weighted like that of pop corns. Now the fire is put off and the drug is stored in airtight container as 'śuddha sphaṭika'.

### Sphaṭika śodhana- 2nd method:

तुवरि काञ्जिके क्षिप्त्वा त्रिदिनाच्छुद्धिमृच्छति ।

(R. R. S. 3/64)

Aśuddha sphaṭika is kept immersed in 'kāñjī' for 3 days. On 4th day, it is taken out, dried and used as 'śuddha sphaṭika'. With this method, the main disadvantage is that, the considerable part of the drug will be dissolved in kāñjī.

### Sphaṭika- māraṇa:

वह्नौ प्रोत्फुल्लयेत् किं वा सम्यग् लघुपुटे पचेत् । कुन्दवज्जायते भस्म सर्वरोगेषु योजयेत् ।।

(Pārada Saṁhitā)

Śuddha sphaṭika is enclosed in a 'śarāva sampuṭa' and subjected for one laghu puṭa to obtain white coloured bhasma of 'sphaṭika', which can be used for all therapeutic purposes.

### Sphaṭika- properties:

कांक्षी कषाया कटुका च तिक्ता ख्याता तथोष्णा विषदोषहन्त्री ।
विसर्प कण्डूतिहरा च केश्या श्वित्रापहा वै व्रणरोपणा च ।।
नेत्ररोगप्रशमनी विषमज्वरनाशिनी । रतिमन्दिरसङ्कोचकारिणी व्रणहारिणी ।।
ग्राहिणी लेखनी स्निग्धा रुधिरस्रावरोधिनी । मुखरोगहरा चैव दन्तदार्ढ्यकरी मता ।।

(R. T. 11/181-183)

Sphaṭika will have kaṣāya-kaṭu-tikta rasa and uṣṇa vīrya. It mitigates 'viṣa doṣa' in the body. Its judicious use will be beneficial to cure 'visarpa' and 'kaṇḍū' roga. It nourishes hair-roots and hair (keśya). It cures 'świtra roga' and is a good healer of wounds. It is useful in all types of eye diseases and intermittent fevers.

It is useful in restoring the laxity of the female genital organs and can heal the local wounds effectively. It has grāhī, lekhana and snigdha properties. It prevents excessive bleeding, cures stomatitis and strengthens gums and teeth.

- Another reference:

काङ्क्षी कषाया कटुकाम्ल कण्ठ्या केश्या व्रणघ्नी विषनाशिनी च ।
श्वित्रापहा नेत्रहिता त्रिदोषशान्तिप्रदा पारदजारणी च ॥ (R. R. S. 3/63)

Sphaṭika will have kaṣāya-kaṭu-amla rasa. It is kaṇṭhyā (useful in diseases of throat), keśya (good for hair growth), vraṇaropaka (good wound healer) and viṣaghnī (mitigates 'viṣa doṣa' in the body). Its judicious use will be beneficial to cure świtra roga and netra roga. It mitigates all the three vitiated doṣas and is useful in pārada jāraṇa.

### Sphaṭika- dosage:

Two to four rattī (250 to 500 mgs) is the general dosage of 'śuddha sphaṭika' or 'sphaṭika bhasma' for internal administration.

### Sphaṭika sattvapātana- 1st method:

क्षाराम्लैर्मर्दिता ध्माता सत्त्वं मुञ्चति निश्चितम् । (R. R. S. 3/65)

Required quantity of 'śuddha sphaṭika' is triturated in clean khalva yantra along with selected 'kṣāra dravya' and 'amla dravya' to prepare a 'bolus'. This bolus is dried, enclosed in suitable sized 'andha mūṣā' or 'vṛntāka mūṣā' and subjected for intense heat to obtain sphaṭika sattva.

### Sphaṭika sattvapātana- 2nd method:

गोपित्तेन शतं वारान् सौराष्ट्रीं भावयेत्ततः । धमित्वा पातयेत्सत्त्वं क्रामणं चातिगुह्यकम् ॥
(R. R. S. 3/65)

Required quantity of 'śuddha sphaṭika' is taken in clean khalva yantra. It is subjected for one bhāvanā with required quantity of 'gopitta'. The dry powder obtained is enclosed in suitable sized 'andha mūṣā' or 'vṛntāka mūṣā' and subjected for intense heat to obtain sphaṭika sattva.

The sattva obtained through this method will be especially useful in 'pārada krāmaṇa saṁskāra'. Therefore, it is claimed in the verse to keep it confidential.

### Sphaṭika- few compound formulations:

1. Elādi mantha
2. Śaṅkhadrāvaka rasa
3. Catuḥsudhā rasa
4. Nayanaśoṇāñjana
5. Garuḍāñjana

## 5. HARATĀLA

(Arsenic trisulfide: $As_2S_3$)

**Introduction:**

Haratāla is the fifth mineral drug of uparasa group. It is identified as 'orpiment' or 'yellow arsenic' in English. Chemically it is identified as 'arsenic trisulphide' and its chemical formula is $As_2S_3$. It is insoluble in water and is brittle. When heated, it burns and releases 'sulphur dioxide' and 'arsenic oxide'. Arsenic in all forms is highly toxic. 125 to 250 mgs of arsenic will be lethal to humans.

**Arsenic and health:**

Arsenic is one of the most toxic elements that can be found. Despite their toxic effect, inorganic arsenic bonds occur on earth naturally in small amounts. Humans may be exposed to arsenic through food, water and air. Exposure may also occur through skin contact with soil or water that contains arsenic.

Levels of arsenic in food are fairly low, as it is not added due to its toxicity. However, levels of arsenic in fish and seafood may be high, because fish absorb arsenic from the water they live in. Luckily, this is mainly the fairly harmless organic form of arsenic, but fish that contain significant amounts of inorganic arsenic may be a danger to human health.

Exposure to **inorganic arsenic** can cause various health effects, such as irritation of the stomach and intestines, decreased production of red and white blood cells, skin changes and lung irritation. It is suggested that the uptake of significant amounts of inorganic arsenic can intensify the chances of cancer development, especially the chances of development of skin cancer, lung cancer, liver cancer and lymphatic cancer.

A very high exposure to inorganic arsenic can cause infertility and miscarriages with women, heart disruptions and brain damage with both men and women. Finally, inorganic arsenic can damage DNA. A lethal dose of arsenic oxide is generally regarded as 100 mg.

**Organic arsenic** can cause neither cancer, nor DNA damage. But exposure to high doses may cause certain effects to human health, such as nerve injury and stomach-aches.

**Arsenic and its environmental effects:**

The arsenic cycle has broadened as a consequence of human interference and due to this, large amounts of arsenic end up in the environment and in living organisms. Arsenic is mainly emitted by the copper producing industries, but also during lead and zinc production and in agriculture. It cannot be destroyed once it has entered the environment.

Plants absorb arsenic fairly easily, so that high-ranking concentrations may be present in food. The concentrations of the dangerous inorganic arsenics that are currently present in surface waters enhance the chances of alteration of genetic materials of fish. This is mainly caused by accumulation of arsenic in the bodies of plant-eating freshwater organisms. Birds eat the fish that already contain eminent amounts of arsenic and will die as a result of arsenic poisoning as the fish is decomposed in their bodies.

### Occurrence:

A little un-combined arsenic occurs naturally as microcrystalline masses, found in Siberia, Germany, France, Italy, Romania and in the USA. Most arsenic is found in conjunction with sulphur in minerals such as arsenopyrite, realgar, orpiment and enargite.

### Properties:

| | |
|---|---|
| Identified as | Orpiment or Yellow arsenic |
| Chemical name | Arsenic trisulfide |
| Chemical formula | $As_2S_3$ |
| When heated | Burns and releases 'sulphur dioxide' and 'arsenic oxide' |
| Lethal dose | 125 to 250 mgs of unpurified arsenic will be lethal to humans |
| Hardness | Highly fragile |
| Solubility | Insoluble in water |

### Haratāla- synonyms:

हरितालं मतं तालं तालकं नटभूषणम् । नटमण्डनकञ्चापि मतं शैलूषभूषणम् ॥
विडालकं चित्रगन्धं पिञ्जरं वंशपत्रकम् । आलं पीतनकञ्चापि कथितं मल्लगन्धजम् ॥
तालकं जायते यस्मान्मल्लगन्धकमिश्रणात् । तस्माद्भिषग्वरैरेतन्मल्लगन्धजमुच्यते ॥
(R. T. 11/1-3)

Haritāla, tāla, tālaka, naṭa-bhūṣaṇa, naṭa-maṇḍana, śailūṣa-bhuṣaṇa, viḍālaka, citra-gandhaka, piñjara, vaṁśa-patraka, āla, pītanaka and malla-gandhaka; all these are the different synonyms used in the classics for the drug 'Arsenic trisulfide' ($As_2S_3$). Since haratāla is the mixture of malla (arsenic) and gandhaka (sulphur), it is called as malla-gandhaja.

### Haratāla- brief history:

This mineral is in therapeutic use since 'Caraka Saṁhitā' period. Books of 'Rasaśāstra' have explained about this drug in detail and have counted this drug under 'uparasa' group. It goes as an ingredient in many compound formulations of Āyurveda.

### Haratāla- two types:

तालकं द्विविधं ख्यातं रससिद्धैः पुरातनैः । प्रथमं पत्रतालं स्याद् द्वितीयं पिण्डतालकम् ।।

(R. T. 11/4)

1. Patra haratāla and 2. Piṇḍa haratāla; are the two varieties of haratāla are identified by ancient seers of this field.

### Patra haratāla- appearance:

सुवर्णवर्णं विमलं गुरु चापि महोज्ज्वलम् । तनुपत्राचितं स्निग्धं मतं तत्पत्रतालकम् ।। (R. T. 11/5)

The patra haratāla will have the shade of golden colour (suvarṇa varṇa); it will be dirt-free (vimala), heavy (guru) and lustrous (mahojjvala); it possesses noticeable thin layers (tanu-patra) and will be soft (snigdha) to touch. This variety of haratāla is fit for therapeutic use.

### Piṇḍa haratāla- appearance:

निष्प्रभं स्वल्पसत्त्वञ्च पत्रहीनं तथा लघु । विशेषतः पिण्डरूपं स्मृतं तत्पिण्डतालकम् ।।

(R. T. 11/6)

The piṇḍa haratāla will be lustreless (niṣprabha); it possesses very less or no sattva (essence); it does not contain any layers but comes in the form of 'piṇḍa' (single mass); it will not be heavy but light in weight. This variety of haratāla is unfit for therapeutic purposes.

### Patra and piṇḍa haratāla- grāhyatwa:

पत्रतालं त्रिदोषघ्नं कुष्ठरोगहरं परम् । वातरक्तप्रशमनं परमेतद्रसायनम् ।।
पिण्डतालं समाख्यातं भृशं स्त्रीपुष्पहारकम् । पत्रतालात्स्वल्पगुणं विशेषाद्धेयमेव तत् ।।

(R. T. 11/7-8)

Patra haratāla when judiciously used in appropriate form, it mitigates all the three doṣas (tridoṣa-śāmaka); it is useful in all types of skin diseases (kuṣṭha roga) and gouty arthritis (vātarakta); it may also be used as a good rejuvenator (rasāyana). It is the grāhya variety for therapeutic purposes.

Whereas 'piṇḍa haratāla' if administered will cause cessation of menstrual flow; it possesses very less or no therapeutic properties in it; so it is not chosen for medicinal purposes.

**Haratāla śodhana- necessity:**

अशुद्धं तालमार्युघ्नं कफमारुतमेहकृत् । तापस्फोटाङ्गसङ्कोचं कुरुते तेन शोधयेत् ।। (R. R. S. 3/69)

Administration of 'aśuddha haratāla' brings down the life span by causing kapha-vātaja roga. It causes prameha roga. It increases the body temperature, causes blisters over skin and induces body tremors. Therefore, it is always better to purify 'haratāla' before its internal administration.

**Haratāla śodhana- 1st method:**

स्वित्रं कूष्माण्डतोये वा तिलक्षारजलेऽपि वा । तोये वा चूर्णसंयुक्ते दोलायन्त्रेण शुद्ध्यति ।।
(R. R. S. 3/70)

The roughly pounded 'patra haratāla' is tied in a 'poṭṭalī' and subjected for 3 hours (one yāma) of 'swedana' in 'dolāyantra' by keeping 'kūṣmāṇḍa swarasa' or 'tilakṣāra jala' or 'cūrṇodaka' as liquid media. Later the drug is dried and stored in airtight container as 'śuddha haratāla'.

Note: The dolāyantra swedana may also be carried out by keeping 'nimbū rasa' or 'gṛhavārī' or 'śālmalī mūla swarasa' as liquid medias as per other references.

**Haratāla śodhana- 2nd method:**

चूर्णीकृतं पत्रतालं चूर्णनीरेण भावयेत् । सप्तवारं प्रयत्नेन शुद्धिमायात्यनुत्तमाम् ।। (R. T. 11/25)

The fine powder of the 'patra haratāla' is subjected for 7 bhāvanās with 'cūrṇodaka' to purify haratāla. Later the drug is dried and stored in airtight container as 'śuddha haratāla'.

**Haratāla māraṇa- 1st method:**

मधुतुल्ये घनीभूते कषाये ब्रह्ममूलजे । त्रिवारं तालकं भाव्यं पिष्ट्वा मूत्रेऽथ माहिषे ।।
उपलैर्दशभिर्देयं पुटं रुद्ध्वाऽथ पेषयेत् । एवं द्वादशधा पाच्यं शुद्धं योगेषु योजयेत् ।।
(R. R. S. 3/74-75)

Śuddha haratāla is taken in a clean khalva yantra and triturated to obtain it in fine powder form. This powder is subjected to three bhāvanās with thick decoction of 'palāśa mūla twak'. Later the drug is subjected to another bhāvanā with 'buffalo's milk' to prepare 'cakrikās' (pellets) of desired size and thickness.

These pellets are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for heat using 10 dry cow dung cakes (laghu puṭa). All this process is repeated 12 times to subject the drug for 12 number of puṭa to obtain appropriate 'haratāla bhasma'. It is later stored in suitable airtight container for further therapeutic use.

### Haratāla māraṇa- 2nd method:

विमलं पत्रतालन्तु त्रिवारं भावयेद्भिषक् । पलाशमूलजैः क्वाथैर्घनीभूतैर्विधानतः ।।
माहिषेण च मूत्रेण भावयेच्च ततः परम् । कपोताख्यपुटेनैव पचेत्तालं भिषग्वरः ।।
एवं पुटैर्द्वादशभिस्तालकं मृतिमाप्नुयात् । इत्थं मृतं तालकन्तु वीतशङ्कः प्रयोजयेत् ।।

(R. T. 11/42-44)

Śuddha patra haratāla is taken in a clean khalva yantra and subjected for three bhāvanās with required quantity of thick decoction of 'palāśa mūla' followed by another three bhāvanās with 'buffalo's urine'. Later 'cakrikās' (pellets) of desired size and thickness are prepared and dried under sun.

These dry pellets are enclosed in a 'śarāva sampuṭa' and subjected for one 'kapota puṭa'. Like this 12 puṭa are applied to obtain lustre free 'haratāla bhasma'. It is later stored in suitable airtight container for further therapeutic use. The bhasma prepared with this method can be put to therapeutic use with no inhibitions.

### Haratāla bhasma- test:

तालं मृतं तदा ज्ञेयं वह्निस्थं धूमवर्जितम् । सधूमं न मृतं प्राहुर्वृद्धवैद्या इति स्थितिः ।।

(Āy. Pra. 2/180)

When a pinch of 'haratāla bhasma' is put on fire, if it does not produce any smoke, it should be considered as the properly prepared 'haratāla bhasma'. If smoke is produced, then one should infer that the bhasma is incomplete.

- Another test: (R. T. 11/57-59)

In a wide based conical glass jar, 10 to 20 ml of 'lavaṇa-drāva' (hydrochloric acid) is taken. It is added with 1 rattī (125 mgs) of bhasma sample. Now the glass jar is placed over a tripod stand with spirit lamp below. While heating if the yellowish sediment is seen at the base of the liquid, one should consider the sample as properly prepared 'haratāla bhasma'.

### Haratāla bhasma- properties:

हरितालं कटु स्निग्धं कषायोष्णं हरेद्विषम् । कण्डूकुष्ठादिरोगास्रकफपित्तकचव्रणान् ।।

(Āy. Pra. 2/176)

Haratāla bhasma possesses kaṭu-kaṣāya rasa, uṣṇa vīrya and snigdha guṇa. When used judiciously for internal administration, it nullifies the effect of viṣa. It is indicated in kaṇḍū, kuṣṭha roga, other skin diseases, raktapitta and vraṇa.

- Another reference:

हरितालं कटु स्निग्धं कषायञ्च विसर्पनुत् ।

तालकं हरते रोगान् कुष्ठमृत्युज्वरादिकान् । संशुद्धं कान्तिवीर्य्यौज: कुरुते मृत्युनाशनम् ।।

(R. Sā. Saṅ. 1/187)

Haratāla bhasma possesses kaṭu-kaṣāya rasa and snigdha guṇa. When used judiciously for internal administration, it cures visarpa roga, kuṣṭha roga and jwara. It improves the body radiance and postpones the old age and death.

- Another reference:

श्लेष्मरक्तविषवातभूतनुत्केवलञ्च खलु पुष्पहृत्त्रिय: ।
स्निग्धमुष्णकटुकञ्च दीपनं कुष्ठहारि हरतालमुच्यते ।। (R. R. S. 3/38)

Haratāla bhasma when used judiciously for internal administration, it cures the diseases of kapha and rakta doṣa. It nullifies the effect of viṣa and is useful in infections (bhūta-bādhā).

Administration of 'haratāla bhasma' alone will cure menstrual disorders of women. It possesses snigdha guṇa, uṣṇa vīrya and kaṭu rasa. It is a good appetizer and cures all types of skin diseases.

- Another reference:

मृतं तालं हरेद् घोरं फिरङ्गं सुचिरोत्थितम् । वातरक्तं विसर्पञ्च विपादीञ्च विचर्चिकाम् ।।
विविधानि च कुष्ठानि ह्यर्शांसि विषमज्वरम् । रोगं फिरङ्गजं हन्यादपस्मारं भगन्दरम् ।।
व्रणं नाडीव्रणञ्चापि विस्फोटमतिदारुणम् । वातरक्तभवान् रोगानन्यानपि हरेद् भृशम् ।।

(R. T. 11/52-54)

Haratāla bhasma when judiciously used will cure severe and chronic 'phiraṅga roga'. It is also useful in vātarakta, visarpa, vipādikā, vicarcikā, many other types of kuṣṭha roga and viṣama jwara. It is also effective in complications of phiraṅga roga, apasmāra and bhagandara roga. It can cure chronic wounds, nāḍīvraṇa, severe visphoṭa roga and complications of vātarakta roga.

**Śuddha haratāla/haratāla bhasma- dosage:**

पादांशतो रक्तिकाया: रक्तिकार्द्धमितं परम् । विमलं च मृतं तालं प्रयुञ्जीत भिषग्वर: ।।

(R. T. 11/56)

Quarter rattī (31 gms) to half rattī (62 gms) is the dosage of both śuddha haratāla or of haratāla bhasma. However, the dosage has to be finalized after careful consideration of all the factors that influence the dosage.

Note: Haratāla is used in 'incinerated form' for therapeutic purposes and in 'purified form' for pharmaceutical purposes. In incinerated (bhasma) form, the haratāla may be judiciously used alone with suitable adjuvant in suitable disease conditions. Whereas in 'purified form', it usually goes as an ingredient in many of its compound formulation.

As haratāla is an 'arsenic' compound, one should be careful while using this drug in any of these forms. If used in higher dosage, the medicine may irritate the gastric and intestinal mucosa.

## Haratāla bhasma sevana- anupāna and pathya:

गुडूच्यादि कषायेण गदानेतान् व्यपोहति ।
एतद्भेषजं सेवी तु लवणाम्लौ विवर्जयेत् । तथा कटुरसं वह्निमातपं दूरतस्त्यजेत् ।।
लवणं यः परित्यक्तुं न शक्नोति कथञ्चन । स तु सैन्धवमश्नीयान्मधुरोपरसः हि सः ।।
(Bhāvaprakāśa)

Haratāla bhasma is administered along with guḍūcī kaṣāya or any other suitable adjuvant. The person consuming 'haratāla bhasma' should avoid lavaṇa, amla and kaṭu rasa dravya and exposure to fire or hot sun. If avoiding lavaṇa is not possible then it is advised to use saindhava lavaṇa instead of any other salt.

## Haratāla toxicity- antidote:

ससितं जीरकक्षोदं कूष्माण्डस्वरसन्तु वा । अश्नीयात्तालविकृतौ त्रिवारं त्वेकवासरे ।।
(R. T. 11/103)

If any toxic effects are seen in the body of the person by consumption of improperly purified 'haratāla' or any of its compound formulations, then they can be nullified by administration of 'kūṣmāṇḍa swarasa', thrice daily in suitable dosage along with 'sugar' and 'jīraka cūrṇa'.

## Haratāla sattvapātana:

पलालकं रवेर्दुग्धैर्दिनमेकं विमर्दयेत् । क्षिप्त्वा षोडशिका तैले मिश्रयित्वा ततः पचेत् ।।
अनावृतप्रदेशे च सप्तयामावधिध्रुवम् । स्वाङ्गशीतमधःस्थञ्च सत्त्वं श्वेतं समाहरेत् ।।
(R. R. S. 3/80-81)

One pala (48 gms) of 'śuddha haratāla' (purified with kūṣmāṇḍa swarasa) is taken in a clean khalva yantra. It is subjected for 1 day's trituration with 'arka dugdha'.

Later, the drug is mixed with 16 parts of 'tila taila'. This mixture is now filled into 'mṛtkapaṭita kācakūpī' (a glass beer bottle covered with 7 layers of mud-smeared cloth). The bottle is now placed in 'vālukā yantra' and subjected for intense heat of 7 prahara (21 hours). When cool on its own, the white powder at the base of the bottle is collected and stored in airtight container as 'haratāla sattva'.

Note: One-eighth rattī (15.6 mgs) of this sattva is used for internal administration to cure kuṣṭha, many other such skin diseases and particularly useful in 'świtra kuṣṭha'.

**Rasamāṇikya:**

अभ्रसंपुटगं तालं किञ्चिदङ्गारसाधितम् । वातश्लेष्मज्वरे शस्तं माणिक्यरसशब्दितम् ।।

(Siddha Bheṣaja Maṇimālā)

Two māṣa (2 gms) of purified 'patra haratāla cūrṇa' is now placed in between two selected 'abhraka patra' (mica sheets, wide enough to hold the drug) and the edges on all sides are clamped. This 'abhra-sampuṭa' is now held firmly with holders (sandaṁśa yantra) and the sandwiched drug inside is exposed to moderate heat.

When the colour of the drug inside the 'abhra-sampuṭa' appears like that of 'māṇikya' (blood-red colour), the heating is stopped. The 'māṇikya' coloured compound in between sheets of mica is collected and stored in suitable container as 'rasamāṇikya'.

Note:

- At once, only two gms of 'śuddha haratāla' can be processed with this method. Therefore, the procedure needs to be repeated many times to prepare the 'rasamāṇikya' in larger quantities.
- The edges of the mica sheets may be clamped with a stapler or stitched with a string thread. Heating may be carried out on the heat of LPG gas stove. This method is usually followed for practical demonstrations.
- This 'rasamāṇikya' is useful in vāta-kaphaja jwara and it can be used in all the places where 'haratāla bhasma' is used.
- The similar reference may be traced from Rasataraṅgiṇī 11/90-93; along with other methods of 'rasamāṇikya' preparation.

**Haratāla- artificial preparation method:** (R. T. 11/ 9-12)

1. Śuddha śaṅkha-viṣa (white arsenic or gaurīpāṣāṇa; $As_2O_3$)- 46 parts; and 2. Śuddha gandhaka (sulphur)- 24 parts; both these drugs are taken in specified ratio in a clean khalva yantra and triturated. The mixture obtained is enclosed in a 'ḍamaru yantra' (refer 4th chapter) and subjected to mild for a day.

When cool on its own, the pots of 'ḍamaru yantra' are separated and the newly formed 'haratāla' is found adhered at the base of the upper pot. It is carefully collected and stored in airtight container. This is artificial preparation method of haratāla.

Note: When 'śaṅkha-viṣa' and 'gandhaka' are used in purified form, there is no need to purify the 'haratāla' again.

**Haratāla- few compound formulations:**

1. Tālakeśwara rasa
2. Kastūrībhairava rasa
3. Tālasindūra
4. Samīrapannaga rasa
5. Rasamāṇikya
6. Vātagajāṅkuśa rasa

## 6. MANAḤŚILĀ

(Arsenic disulphide:$As_2S_2$)

**Introduction:**

Manaḥśilā is the sixth mineral drug of uparasa group. It is identified as 'realgar' in English. This is also a reddish brown arsenic compound, chemically known as arsenic disulphide with chemical formula $As_2S_2$.

It ignites at high temperature and leaves out sulphur dioxide and arsenic trioxide as major products of combustion.

The remaining ore details of this mineral and its occurrence are same as that of 'haratāla' explained earlier. Since this is a highly toxic drug, its '**toxicokinetics**' is provided below;

**Absorption:**

Insoluble compounds, such as arsenic disulphide, are poorly absorbed after ingestion. The efficiency of absorption is dependent on particle size; fine powders are better absorbed than larger particles.

Following inhalation irrespirable particles are trapped in the upper airways and deposited in the gastrointestinal tract by mucociliary clearance. Direct evidence of transcutaneous arsenical absorption in man is scarce.

**Distribution:**

Absorbed arsenic is distributed to all body tissues. High concentrations would be expected in keratin-rich tissues such as hair, skin and nails due to sulfhydryl group binding.

Trivalent arsenic is methylated in the liver to methylarsonic acid and dimethylarsinic acid. Short-term studies on humans indicate that daily intake in excess of 0.5 mg progressively, but not completely, saturate the capacity to methylate inorganic arsenic.

**Excretion:**

The half-life of arsenic in blood is about 60 hours with rapid renal excretion predominantly as mono- and dimethyl- derivatives. The whole body half-life of arsenic in six human volunteers fitted a three compartment system, with 65.9 per cent of orally administered arsenic acid having a half-life of 2.1 days, 30.4 per cent a half-life of 9.5 days and 3.7 per cent a half-life of 38.4 days (mean values).

In animal studies small amounts of parenteral administered arsenic trioxide appear in the faeces, suggesting minor biliary clearance

**Properties:**

| | |
|---|---|
| Identified as | Realgar |
| Chemical name | Arsenic disulphide |
| Chemical formula | $As_2S_2$ |
| Lethal dose | 125 to 250 mgs of unpurified arsenic will be lethal to humans |
| Hardness | Feagile and can be easily powdered |
| Major products of combustion | Sulphur dioxide and arsenic trioxide |
| Solubility | Insoluble in water, but soluble in hot and concentrated nitric acid |

**Manaḥśilā- synonyms:**

> मन:शिला रोगशिला शिला नैपालिका तथा । मनोगुप्ता मनोज्ञा च मनोह्वा नागजिह्विका ।।
> कुनटी कुलटी गोला नागमाता च सा मता । कल्याणिका च सैवेह कथिता रसनेत्रिका ।।

(R. T. 11/104-105)

Manaḥśilā, rogaśilā, śilā, naipālikā, manoguptā, manojñā, manohvā, nāgajivhikā, kunaṭī, kulaṭī, golā, nāgamātā, kalyāṇikā and rasanetrikā; are the synonyms of 'Arsenic disulphide' ($As_2S_2$) used in classics.

**Manaḥśilā- brief history:**

This mineral is in therapeutic use since 'Caraka Saṁhitā' period. Books of 'Rasaśāstra' have explained about this drug in detail and have counted this drug under 'uparasa' group. It goes as an ingredient in many compound formulations of Āyurveda.

**Manaḥśilā- types:**

- Acc to Rasaratnasamuccaya:

> मनःशिला त्रिधा प्रोक्ता श्यामाङ्गी कणवीरका । खण्डाख्या चेति तद्रूपं विविच्य परिकथ्यते ।।
> श्यामा रक्ता सगौरा च भाराढ्या श्यामिका मता । तेजस्विनी च निर्गौरा ताम्राभा कणवीरका ।।
> चूर्णीभूताऽतिरक्ताङ्गी सभारा खण्डपूर्विका । उत्तरोत्तरतः श्रेष्ठा भूरिसत्त्वा प्रकीर्तिताः ।।

(R. R. S. 3/88-90)

Following are the three type of 'manaḥśilā' along with their properties;

1. Śyāmāṅgī: This variety will be blackish in colour added with red and yellow. It will be heavy and is considered the best variety (śreṣṭha) out of all the three.
2. Kaṇavīrakā: This variety will be reddish and lustrous like copper but not yellow. It will be heavier than the earlier variety and is considered 'madhyama' in its qualities.
3. Khaṇḍākya: This variety will be very brittle. It possesses deep-red colour and will be very heavy. Such a samplė of 'manaḥśilā' is considered 'adhama' in its qualities.

- Acc to Āyurveda Prakāśa:

शामा हिङ्गुलवद् रक्ता किञ्चित्पीताऽतिदीप्तिका । कणवीरा रक्तवर्णा चूर्णरूपाऽतिभारयुक् ।।
किञ्चिद्रक्ता च गौरा च द्विखण्डा भारवत्तरा । त्रिविधासु च श्रेष्ठा स्यात् कणवीरमनःशिला ।।

(Āy. Pra. 2/296)

Following are the three type of 'manaḥśilā' along with their properties;

1. Śyāmā: This variety will be reddish like 'hiṅgula' (cinnabar) and light yellow in colour. It will be lustrous and is considered the best variety (śreṣṭha) out of all the three.
2. Kaṇavīrā: This variety will be reddish in colour. It will be in powder form and is heavier than the earlier variety and is considered 'madhyama' in its qualities.
3. Khaṇḍākya: This variety possesses pale reddish colour and will be very heavy. Such a sample of 'manaḥśilā' is considered 'adhama' in its qualities.

- Acc to Rasakāmadhenu:

रक्ता पीता तु खण्डाख्या पूर्वपूर्वा स्मृतोत्तमा ।।

(Rasakāmadhenu)

Three varieties of 'manaḥśilā' are 1. Rakta (śreṣṭha) 2. Pīta (madhyama) and 3. Khaṇḍākya (adhama).

**Types- tabular representation:**

| Acc to R. R. S. | Acc to Āyurvedaprakāśa | Acc to Rasakāmadhenu |
|---|---|---|
| 1. Śyāmāṅgī (śreṣṭha)<br>2. Kaṇavīrakā (madhyama)<br>3. Khaṇḍākya (adhama) | 1. Śyāmā (śreṣṭha)<br>2. Kaṇavīrā (madhyama)<br>3. Dwikhaṇḍa (adhama) | 1. Rakta (śreṣṭha)<br>2. Pīta (madhyama)<br>3. Khaṇḍākya (adhama) |

dr. keshav raj

### Manaḥśilā- grāhya swarūpa:

मनःशिला शिलाखण्डशून्या रक्तोत्पलप्रभा । भारे गुरुतरा दीप्ता शोधनार्हा मता बुधैः ॥
(R. T. 11/106)

The grāhya manaḥśilā that can be chosen for purification will be free from any of the physical impurities (mud, gravel etc). It possesses the radiance of 'rakta-kamala' (red lotus). In addition, it will be heavy and lustrous. Such a sample of 'manaḥśilā' is considered for the purpose of purification and for further pharmaceutical or therapeutic use.

### Manaḥśilā śodhana- necessity:

अश्मरीं मूत्रकृच्छ्रञ्च अशुद्धा कुरुते शिला । मन्दाग्निं मलबन्धं च शुद्धा सर्वरुजापहा ॥
(R. R. S. 3/92)

Impure or improperly purified 'manaḥśilā' if administered by mistake causes 'mūtrāśmarī' (urinary calculi), mūtrakṛcchra (painful micturition). It also causes severe loss of appetite and constipation.

Whereas the purified 'manaḥśilā' will be therapeutically fit to cure all types of diseases. Therefore, the purification of 'manaḥśilā' becomes a necessity.

### Manaḥśilā śodhana- 1st method:

अगस्त्यपत्रतोयेन भाविता सप्तवारकम् । श्रृङ्गवेररसैर्वाऽपि विशुद्ध्यति मनःशिला ॥
(R. R. S. 3/93)

आर्द्रकस्वरसेनेह मनोगुप्तां तु भावयेत् । सप्तवारं विधानेन शुद्धिमाप्नोति सर्वथा ॥ (R. T. 11/114)

The fine powder of 'aśuddha manaḥśilā' is taken in a clean khalva yantra and subjected for 7 bhāvanās with 'agastya patra swarasa' or 'nimbū swarasa' or with 'ārdraka swarasa'. Later the fine powder of the drug is dried completely and stored in suitable container as 'śuddha manaḥśilā'.

### Manaḥśilā śodhana- 2nd method:

सुधोदके निपातिता मनःशिला तु चूर्णिता । दिनत्रयाद्विनिर्गता भवेत्तु दोषवर्जिता ॥ (R. T. 11/109)

The roughly pounded 'aśuddha manaḥśilā' is poured into a vessel containing enough quantity of 'sudhā jala' (lime water) and left for two days. On 3rd day, the drug is washed with warm water, dried completely and stored in suitable container as 'śuddha manaḥśilā'.

### Manaḥśilā śodhana- 3rd method:

भृङ्गराजरसेनेह दोलायन्त्रे विपाचिता । चतुर्यामं रोगशिला शुद्धिमायात्यनुत्तमाम् ॥ (R. T. 11/110)
जयन्तीस्वरसेनेह दोलायन्त्रे विपाचितः । चतुर्यामं विधानेन विशुध्यति मनःशिला ॥ (R. T. 11/112)

The roughly pounded 'aśuddha manaḥśilā' is tied in a poṭṭalī and hung in 'dolāyantra' with 'bhṛṅgarāja swarasa' or 'jayantī swarasa' as liquid media. The process of swedana is carried out for four yāma (12 hrs). Later the drug is washed with warm water, dried completely and stored in suitable container as 'śuddha manaḥśilā'.

**Manaḥśilā- properties:**

मन:शिला कटुस्तिक्ता स्निग्धोष्णा लेखनी गुरुः । कासश्वासहरा कामं भूतोपद्रवनाशिनी ।।
अग्निमान्द्यक्षयानाहहन्त्री कण्डूतिनाशिनी । रसायनी ज्वरहरा वर्ण्या कामं विषापहा ।।

(R. T. 11/115-16)

Purified manaḥśilā will have 'kaṭu-tikta' rasa and 'snigdha-uṣṇa-guru' guṇa. It exhibits 'lekhana' property. When used judiciously, it is useful in kāsa and śwāsa roga. It is found effective in all types of infectious diseases.

It can be used in agnimāndya, kṣaya, ānāha and kaṇḍū. With wise use, it acts as a good rejuvenator (rasāyana). It cures jwara roga, improves the skin radiance (varṇya), enhances virility and acts as an antidote for viṣa (poison) in the body.

- Other references with similar opinion:

मन:शिला गुरुवर्ण्या सरोष्णा लेखनी कटुः । तिक्ता स्निग्धा विषश्वासकासभूतकफास्रनुत् ।।

(Āy. Pra. 2/218)

मन:शिला सर्वरसायनाग्रया तिक्ता कटूष्णा कफवातहन्त्री ।
सत्त्वात्मिका भूतविषाग्निमान्द्यकण्डूतिकासक्षयहारिणी च ।। (R. R. S. 3/91)

**Manaḥśilā- dosage:**

तत्त्वांशतो रक्तिकायाः कलांशप्रमितां तथा । शिला मात्रा विनिर्दिष्टा काशीनाथभिषक्तमैः ।।

(R. T. 11/117)

The dose of 'śuddha manaḥśilā' is 1/32 rattī (3.9 mgs) to 1/16 rattī (7.8 mgs). The mātrā has to be finalized after considering the strength of the patient, the disease and all the other factors that influence the dosage.

**Manaḥśilā toxicity- antidote:**

शिलाविकारोपहतः पिबेत्क्षीरं दिनत्रयम् । मधुना पथ्यसंयुक्तो वान्त्यादिभ्यो विमुच्यते ।।

(R. T. 11/125)

If any toxic effects like vomiting, thirst, dizziness etc are seen in the body of the person by consumption of improperly purified 'manaḥśilā' or any of its compound formulations, then they can be nullified by administration of 'milk' added with 'honey' daily for 3 days. During this time, patient is advised to be on healthy diet.

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### Manaḥśilā- sattvapātana:

गुडगुग्गुलुकिट्टाज्यैस्त्वष्टमांशेन वै पृथक् । शिला मूषागतां कोष्ठ्यां ध्माता सत्त्वं विमुञ्चति ॥
(R. T. 11/129)

One part of 'śuddha manaḥśilā' is added with 1/8th part each of 'guḍa', 'guggulu', 'loha-kiṭṭa' and 'ghṛta'. The mixture is taken in a crucible of suitable size and subjected for heat in oven to extract sattva of 'manaḥśilā'. Arsenic will be the sattva here

**Manaḥśilā- artificial preparation:** (R. T. 126-128)

1. Śuddha śaṅkha-viṣa (gourīpāṣāṇa)- 46 parts; and 2. Śuddha gandhaka- 16 parts; both these drugs are triturated together. The homogenous mixture obtained is taken in a 'ḍamaru yantra' and subjected to moderate heat for a day. Later, when cool on its own, the 'manaḥśilā' adhered at the inner base of the upper pot is carefully collected and stored in suitable container.

The 'manaḥśilā' prepared in this method does not require any further purification. It can be carefully used for internal administration in the dosage of one sarṣapa (mustard seed).

### Manaḥśilā- few compound formulations:

1. Śwāsakuṭhāra rasa
2. Kṣayakeśarī rasa
3. Trailokyaciñtāmaṇī rasa
4. Manaḥśilādi dhūma
5. Manaḥśilādi ghṛta
6. Manaḥśilādyāñjana

## 7. AÑJANA

(Stibnites: $Sb_2S_3$)

### Introduction:

Añjana set of drugs are counted in seventh place of uparasa group. They are identified as 'stibnite' or 'antimonite' in English. Stibnite or antimonite is a sulphide mineral with the formula $Sb_2S_3$.

This soft grey material crystallizes in an orthorhombic space group. It is the most important source for the metalloid antimony. The name is from the Greek *stibi* through the Latin *stibium* as the old name for the mineral and the element antimony. As an antimony sulphide, it is potentially toxic and should be handled with care.

### Ores:

Stibnite occurs in hydrothermal deposit and is associated with realgar, orpiment, cinnabar, galena, pyrite, marcasite, arsenopyrite, cervantite, stibiconite, calcite, ankerite, barite and chalcedony.

**Occurrence:**

Small deposits of stibnite are common, but large deposits are rare. It occurs in Canada, Mexico, Peru, Japan, China, Germany, Romania, Italy, France, England and Algeria. In the United States it is found in Arkansas, Idaho, Nevada, California, and Alaska. In India small deposits of stibnite are found in Jammu and Kashmir, Bihar and Punjab.

**Añjana- types:**

| **Acc to R. R. S. & Ra. Cū.** | **Acc to Rasajalanidhi** | **Acc to R. T.** | **Acc to Āyurvedaprakāśa** |
|---|---|---|---|
| 1. Souvīrāñjana<br>2. Rasāñjana<br>3. Srotoañjana<br>4. Puṣpāñjana<br>5. Nīlāñjana | 1. Souvīrāñjana<br>2. Rasāñjana<br>3. Srotoañjana<br>4. Puṣpāñjana<br>5. Nīlāñjana<br>6. Kulatthāñjana | 1. Srotoañjana<br>2. Souvīrāñjana | 1. Śwetāñjana<br>2. Kṛṣṇāñjana |

- References:

सौवीरमञ्जनं प्रोक्तं रसाञ्जनमतः परम् । स्रोतोऽञ्जनं तदन्यच्च पुष्पाञ्जनकमेव च ।
नीलाञ्जनं च तेषां हि स्वरूपमिह वर्ण्यते ॥ (R. R. S. 3/98)
अञ्जनं द्विविधं ज्ञेयं स्रोतोजञ्च सुवीरजम् ॥ (R. T. 22/35)
तत्र स्रोतोऽञ्जनं कृष्णं सौवीरं श्वेतमीरितम् । (Āy. Pra. 2/226)

**Añjana types and their properties:**

सौवीरमञ्जनं धूम्रं पीताभं च रसाञ्जनम् । वल्मीकशिखराकारं भङ्गे नीलोत्पलद्युति ॥
घृष्टं तु गैरिकच्छायं स्रोतोजं लक्षयेद्ध्रुवम् । पुष्पाञ्जनं सितं चैव विद्यान्नीलाञ्जनं गुरु ॥
(R. R. S. 3/98-99)

| Añjana types | Properties |
|---|---|
| 1. Souvīrāñjana (Stibnite or Antimonite) | It possesses smoky (dhūmra) colour; (white coloured as per Āyurvedaprakāśa). |
| 2. Rasāñjana (Extract of Barberis aristata) | It comes with yellowish colour. It is of the herbal origin. It is the extract of Barberis aristata or Indian Barberis. |
| 3. Srotoañjana (Stibnite or Antimonite) | It appears like the anthill, broken surface possesses blue colour. When rubbed on a rough surface, leaves out red lines like that of 'gairika'. |
| 4. Puṣpāñjana (Zinc oxide; ZnO) | This comes in white colour. It is usually prepared in laboratories. |
| 5. Nīlāñjana (Gelena) | This comes in blue colour and will be guru (heavy). |

### Añjana types and their synonyms:

| Añjana types | Synonyms |
|---|---|
| 1. Souvīrāñjana | Souvīra, suvīraja, kṛṣṇāñjana and kālāñjana (R. T. 22/37) |
| 2. Srotoañjana | Srotaja, yāmuneya, yāmuna, nīlāñjana and kapotāñjana (R. T. 22/36) |
| 3. Nīlāñjana | Śukrabhūmija, vārisambhava, suvarṇaghna and louhamārdavakara. |
| 4. Puṣpāñjana | Kusumāñjana, puṣpaketu, koustubha, rītika and rītīpuṣpaka. |
| 5. Rasāñjana | Rasagarbha, rasāgraja, rasodbhava, tārkṣya, tārkṣyaśaila, kataka, bālabhaiṣajya, darvīkwāthodbhava, varyāñjana ????? and agnisāra. |

### Añjana- brief history:

The knowledge about 'añjana' is prevalent from Vedic period. Caraka, Suśruta and Vāgbhaṭa have used these drugs for treatment purpose in many places of their books. With evolution of 'Rasaśāstra', all these varieties of 'añjana' were explained in detail and were put to therapeutic use in all possible ways.

### Sroto-añjana swarūpa:

भंगे नीलोत्पलनिभं घर्षणे गैरिकप्रभम् । वल्मीकशीर्षप्रतिमं मतं स्रोतोऽञ्जनं बुधैः ।। (R. T. 22/38)

The 'añjana', which exhibits the colour of 'nīla kamala' when broken; leaves reddish lines like that of 'gairika' when rubbed on to a rough surface; and resembles the ant hills in shape; such a sample of 'añjana' is called as 'sroto-añjana'.

### Souvīrāñjana swarūpa:

बाह्यतः खलु धूमाभं भंगे त्वतिसमुज्ज्वलम्। घर्षे खलु मषीवर्णं सौवीराञ्जनमुच्यते।। (R. T. 22/39)

The 'añjana' which has 'dhūmra varṇa' (smoke colour); when broken, exhibits very shiny part; and when rubbed on a rough surface leaves blackish lines; such a sample of 'añjana' is called as 'souvīrāñjana'.

### Añjana śodhana- general method:

अञ्जनानि विशुद्ध्यन्ति भृङ्गराजनिजद्रवैः । (R. R. S. 3/105)

Proper 'bhāvanā' with 'bhṛṅgarāja swarasa' will purify all types of 'añjana'. Usually seven bhāvanās are carried out for proper purification.

### Souvīrāñjana and sroto-añjana- śodhana:

त्रिफलावारिणी स्वेद्यं तद्द्वयं शुद्धिमृच्छति । भृङ्गराजरसेवाऽपि स्रोतः सौवीरकं शुचिः ।।
(Āy. Pra. 2/232)

To purify both 'sroto-añjana' and 'souvīrāñjana', both the drugs are tied in two separate cloths as 'poṭṭalī' and hung in to 'dolāyantra'. Each drug is subjected to swedana for one yāma (3 hours) with 'triphalā kwātha' or 'bhṛṅgarāja swarasa'.

Later the drugs are dried and stored in separate suitable airtight containers as 'śuddha sroto-añjana' and 'śuddha souvīrāñjana'.

**Souvīrāñjana and sroto-añjana- śodhana (another method):**

> अञ्जनद्वितयं यत्नात् पेषितं त्रिफलाम्भसा । दिनसप्तकमात्रेण विशुध्यति न संशयः ।।
> भृङ्गराजरसेनेह पेषितं त्वञ्जनद्वयम् । दिनसप्तकमात्रेण शुद्धिमायात्यनुत्तमाम् ।। (R. T. 22/40-41)

To purify both 'sroto-añjana' and 'souvīrāñjana', both the drugs are taken in two separate clean khalva yantra, added with required quantity of 'triphalā kwātha' or 'bhṛṅgarāja swarasa' in both and triturated for 7 days. Later the drugs are dried and stored in separate suitable airtight containers as 'śuddha sroto-añjana' and 'śuddha souvīrāñjana'.

**Nīlāñjana śodhana:**

> नीलाञ्जनं चूर्णयित्वा जम्बीररसभावितम् । दिनैकमातपे शुद्धं भवेत्कार्येषु योजयेत् ।।
> (Āy. Pra. 2/238)

To purify 'nīlāñjana', the drug is taken in a clean khalva yantra. It is added with required quantity of 'nimbū swarasa' and triturated for a day. Later the drug is dried under hot sun and stored in suitable airtight container as 'śuddha nīlāñjana'.

**Rasāñjana śodhana:**

> सूर्यावर्तादियोगेन शुद्धिमेति रसाञ्जनम् । (R. R. S. 3/105)

To purify 'rasāñjana', the drug is taken in a clean khalva yantra. It is subjected for 3 bhāvanās with swarasa or kwātha of any one of the 'sūryāvartādi yoga dravya' (sūryāvartaka, kadalī, vandhyā, kośātakī, suradālī, śigru, vajrakanda, nīrakaṇā and kākamācī). Later the drug is dried under hot sun and stored in suitable airtight container as 'śuddha rasāñjana'.

**Añjana śodhana- tabular representation:**

| Añjana types | Śodhana |
|---|---|
| General purification method | Seven bhāvanās with 'bhṛṅgarāja swarasa'; |
| Souvīrāñjana and Srotoañjana | 1. Swedana for one yāma (3 hours) in 'triphalā kwātha' or 'bhṛṅgarāja swarasa'; OR |

| Añjana types | Śodhana |
|---|---|
|  | 2. Mardana for 7 days with 'triphalā kwātha' or 'bhṛṅgarāja swarasa'; |
| Nīlāñjana | Mardana for a day with 'nimbū swarasa' |
| Puṣpāñjana | Śodhana is not required as 'puṣpāñjana' (Zinc oxide; ZnO) is artificially prepared in laboratories; |
| Rasāñjana | Three bhāvanās with swarasa or kwātha of any one of the 'sūryāvartādi yoga dravya'; |

**Añjana māraṇa:**

Incineration of 'anjana' is not required as they are used only in purified form for the therapeutic purposes.

**Souvīrāñjana- properties:**

सौवीरमञ्जनं ग्राहि स्निग्धञ्च तुहिनोपमम् । रक्तपित्तप्रशमनं नेत्रामयहरं परम् ।।
विषहिक्कापहं कामं व्रणशोधनरोपणम् । परं रजोरोधकरं रक्तप्रदरनाशनम् ।। (R. T. 22/45-46)
सौवीरमञ्जनं धूम्रं रक्तपित्तहरं हिमम् । विषहिध्मादिरोगघ्नं व्रणशोधनरोपणम् ।। (R. R. S. 3/100)

Souvīrāñjana possesses grāhī, snigdha and śīta (like that of snow) guṇa. It is useful in raktapitta roga, netra roga (eye diseases), viṣa doṣa and hikkā roga (hiccups).

Its external application in suitable form does keep the wounds clean and heal them ('vraṇa śodhana' and 'vraṇa ropaṇa'). It corrects the 'menstrual disorders' and cures 'raktapradara' roga.

OR

Souvīrāñjana comes with smoky (dhūmra) colour. It is useful for internal administration in raktapitta roga, as it possesses śīta guṇa. It is useful in viṣa and its complications and hikkā roga. When used externally it is a good 'vraṇa śodhaka and ropaka'.

**Sroto-añjana properties:**

स्रोतोऽञ्जनं तु शिशिरं तुवरं लेखनं परम् । स्निग्धं स्वादु परं ग्राहि कफपित्तविषापहम् ।।
हिक्काच्छर्दिप्रशमनं स्तन्यवृद्धिकरं परम् ।। (R. T. 22/43-44)
रक्तपित्तक्षयहरं नेत्रामयनिषूदनम् । नेत्र्यं हिध्माविषच्छर्दिकफपित्तास्ररोगनुत् ।।
स्रोतोऽञ्जनं हिमं स्निग्धं कषायं स्वादु लेखनम् । (R. R. S. 3/102)

Sroto-añjana possesses 'śīta' vīrya; 'kaṣāya' rasa and 'lekhana' (of netra-mala), 'snigdha', 'grāhī' guṇa; and 'madhura' rasa. It mitigates vitiated kapha and pitta doṣa and lessens the impact of 'śārīrika viṣa' doṣa.

It is useful in raktapitta roga, kṣaya roga, netra roga (eye diseases), hikkā roga (hiccups) and chardi roga (vomiting). It improves the output of breast milk.

OR

Sroto-añjana possesses śīta, snigdha and lekhana guṇa; and kaṣāya madhura rasa. It is useful in eye diseases, hikkā roga, viṣa and its complications, chardi roga and the diseases of kapha, pitta and rakta doṣa.

**Rasāñjana properties:**

रसाञ्जनञ्च पीताभं विषवक्त्रगदापहम् । श्वासहिध्मापहं वर्ण्यं वातपित्तास्रनाशनम् ।।

(R. R. S. 3/101)

Rasāñjana will be yellowish in colour. It is beneficial in diseases of viṣa doṣa and all types of mukha roga. It is also indicated in śwāsa and hikkā roga. It acts as varṇya (improves skin complexion) and is beneficial in vātarakta and raktapitta roga.

**Puṣpāñjana properties:**

पुष्पाञ्जनं तु शिशिरं स्निग्धं पित्तप्रणाशनम् । अभिष्यन्दप्रशमनं परं दाहविनाशनम् ।। ५१ ।।
विचर्चिकादित्वग्दोषशमनं व्रणरोपणम् । समाख्यातं विशेषेण हिक्कापञ्चकनाशनम् ।।

(R. T. 22/51-52)

पुष्पाञ्जनं सितं स्निग्धं हिमं सर्वाक्षिरोगनुत् । अतिदुर्धरहिध्माघ्नं विषज्वरगदापहम् ।।

(R. R. S. 3/103)

Puṣpāñjana (zinc oxide) possesses śīta and snigdha guṇa. It mitigates vitiated pitta doṣa. Its external use cures 'netrābhiṣyanda' and brings down the burning sensation of netra.

In 'vicarcikā' (eczema) and other skin diseases, the compound formulations prepared with this medicine are used for external application. It is used to prepare the ointments meant for healing the wounds. In classics, we find its reference as a good medicine for 'hikkā roga'.

OR

Puṣpāñjana will be pale white in colour. It possesses snigdha and śīta guṇa. It is useful in all types of eye diseases. It cures severe hikkā roga and is useful in diseases of viṣa doṣa and all types of jwara roga.

**Puṣpāñjana- artificial preparation:** (R. T. 22/49-50)

When 'pittala' (brass) is melted, the 'yaśada' (zinc) present in it attains molten form and reacts with atmospheric oxygen (ambarapīyūṣa). Because of

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which, it converts into the white powder form like that of sugar. This drug powder is called as 'puṣpāñjana' and is identified chemically as 'zinc oxide'. On the other hand, to prepare 'zinc oxide' only the 'yaśada' (zinc) is taken in an iron vessel. The vessel is placed over high flame and the metal is melted to obtain 'zinc oxide' (puṣpāñjana).

**Nīlāñjana properties:**

नीलाञ्जनं गुरु स्निग्धं नेत्र्यं दोषत्रयापहम् । रसायनं सुवर्णघ्नं लोहमार्दवकारकम् ।।
(R. R. S. 3/104)

Nīlāñjana possesses guru and snigdha guṇa. It is good for eyes and it mitigates all the three vitiated doṣas. It is a good rejuvenator. It is useful in 'suvarṇa māraṇa' and 'loha mārdavakaraṇa'.

**Añjana- dosage:**

गुञ्जार्धतः समारभ्य गुञ्जैकमितमञ्जनम् । दिनद्वयं त्रयं वापि प्रयुञ्जीत भिषग्वरः ।।
अञ्जनद्वितयं रक्तप्रदरे तु दिनत्रयात् । अधिकं नोपयुञ्जीत रसतन्त्रविशारदः ।। (R. T. 22/47-48)

Half to one rattī (62 mgs to 125 mgs) is the general dosage of 'śuddha añjana' for internal administration. If used in 'raktapradara' to hamper the excessive blood flow, this medicine should not be consumed for more than 3 days.

**Añjanatritaya- external use:**

अञ्जनद्वितयं पुष्पाञ्जनेन सहितं तु वा । यशदेनाग्निदग्धेन ह्यभिष्यन्दहरं परम् ।। (R. T. 22/53)

When añjanadwitaya (sroto-añjana and souvīrāñjana) and 'puṣpāñjana' are used together, the medicine will be called as 'añjanatritaya'. This medicine when used for external application, it cures 'netrābhiṣyanda'.

**Añjana- sattvapātana:**

The sattwapātana method of 'añjana' is similar as that of earlier drug 'manaḥśilā'. Here one part of 'śuddha añjana' is added with 1/8th part each of 'guḍa', 'guggulu', 'loha kiṭṭa' and 'ghṛta'. The mixture is taken in a crucible of suitable size and subjected for heat in oven to extract sattva of 'añjana'.

**Añjana- few compound formulations:**

| Añjana types | Compound formulations |
|---|---|
| 1. Souvīrāñjana | Timiraharāñjana, Tuhināñjana, Śīghraprabhāva rasa; |
| 2. Srotoañjana | Rasendramaṅgala rasa, Caṇḍabhairava rasa; |
| 3. Nīlāñjana | Timiraharāñjana, Vaḍavānala rasa, Vātāri rasa, Amṛtārṇava rasa |
| 4. Puṣpāñjana | Cūrṇāñjana |
| 5. Rasāñjana | Puṣyānuga cūrṇa, Aśoka ghṛta, Patraṅgāsava, Pīyūṣavallī rasa; |

## 8. KAṄKUṢṬHA

(Rhubarb)

### Introduction:

Kaṅkuṣṭha is the eighth mineral drug of uparasa group. It is quite a controversial drug. Many classical texts have put forward their own opinion about this drug. Many diverse opinions have contributed heavily to the earlier existed controversy about the drug.

| As per | Kaṅkuṣṭha is |
|---|---|
| 1. Maharṣi Suśruta | A kind of herbal roots that are strong purgatives. |
| 2. Ācārya Ḍalhaṇa | The exudate of the herbal drug 'swarṇakṣīrī' (Argemona mexicana). |
| 3. Rasaratna-samuccaya | A herbal drug grown on the peaks of Himalayan mountains. |
| 4. Others opinion quoted in Rasaratna-samuccaya | The blackish yellow faecal matter of new born elephant.<br>The whitish yellow coloured umbilical cord of new-born horse/mare. |
| 5. Rasārṇava | A drug with the radiance of 'vidruma' (coral). |
| 6. Ācārya Bhālukī | A mineral of 'vaṅga' (tin) variety. |
| 7. According to few | It is a mineral 'mṛddāraśṛṅga' (Litharge, which will be yellowish and heavy. |
| 8. Ācārya Yādavjī | The resin of Mysore gambose tree (Garcinia morella) |
| 9. Believed to be | Rhubarb—a herbal drug that belongs to the genus *Rheum* in the family Polygonaceae. |

### Kaṅkuṣṭha- controversies:

- Reference:

हिमवत्पादशिखरे कङ्कुष्ठमुपजायते । (R. R. S. 3/109)
केचिद्वदन्ति कङ्कुष्ठं सद्योजातस्य दन्तिनः । वर्चश्च श्यामपीताभं रेचनं परिकथ्यते ।।
कतिचित्तेजिवाहानां नालं कङ्कुष्ठसंज्ञकम् ।
वदन्ति श्वेतपीताभं तदतीव विरेचनम् । रसे रसायने श्रेष्ठं निःसत्त्वं बहुः वैकृतम् ।।
(R. R. S. 3/111-112)

### Rhubarb- general information:

If 'kaṅkuṣṭha' is identified as 'Rhubarb', then following is the general information on 'rhubarb'. Rhubarb is a group of plants that belong to the genus *Rheum* in the family Polygonaceae.

They are herbaceous perennial plants growing from short, thick rhizomes.

They have large leaves that are some what triangular, with long fleshy petioles. They have small flowers grouped in large compound leafy greenish-white to rose-red inflorescences.

Rhubarb is usually considered to be a vegetable. In culinary use, fresh raw stalks are crisp with a strong, tart taste. Most commonly, the plant's stalks are cooked with sugar and used in pies and other desserts.

Rhubarb has been used for medical purposes by the Chinese for thousands of years. The term "rhubarb" is a combination of the Ancient Greek *rha* and *barbarum*; here '*rha*' refers both to the plant and to the River Volga on the banks of which this plant grows.

Rhubarb leaves contain poisonous substances, including oxalic acid which is a nephrotoxic and corrosive acid that is present in many plants. In the petioles, the amount of oxalic acid is much lower, only about 2-2.5% of the total acidity, which is dominated by malic acid.

This means the raw stalks may not be hazardous, although the tart taste of raw stalks is so strong as to be unpalatable to many.

**Market availability:**

Presently in the name of 'kaṅkuṣṭha', is the exudate of 'Mysore gambose tree' (Garcinia morella) a well-known herbal drug. This exudate will have reddish yellow colour. When dry it attains powder form. It is imported from Singapore, Malaysia, Myanmar, Indonesia etc.

**Kaṅkuṣṭha- synonyms:**

Kālakaṅkuṣṭha, kolabāluka, tālakuṣṭha, tīkṣṇadugdhikā, raṅgadāyaka, recaka, varāṅga, viraṅga, swarṇakṣīrī niryāsa and hemavatī; all these are the synonymous words used in the classics for the drug 'kaṅkuṣṭha'.

**Kaṅkuṣṭha- types:**

> तत्रैकं नालिकाख्यं हि तदन्यद्रेणुकं मतम् । पीतप्रभं गुरु स्निग्धं श्रेष्ठं कङ्कुष्ठमादिमम् ।
> श्यामपीतं लघु त्यक्तसत्त्वं नेष्टं हि रेणुकम् ।। (R. R. S. 3/109-110)

Kaṅkuṣtha will be of two types;

| Two types | Details |
|---|---|
| 1. Nalikā kaṅkuṣṭha | It will be yellowish in colour, shiny, heavy, smooth and is considered 'śresṭha' for therapeutic purposes. |
| 2. Reṇuka kaṅkuṣṭha | It comes with blackish yellow colour, light weight and no essence; it is unfit for therapeutic use. |

## Kaṅkuṣṭha- śodhana:

कङ्कुष्ठं शुद्धिमायाति त्रिधा शुण्ठ्यम्बुभावितम् । सत्त्वाकर्षोऽस्य न प्रोक्तो यस्मात्सत्त्वमयं हि तत् ॥
(R. R. S. 3/114)

The 'nalikā kaṅkuṣṭha' is taken in a clean khalva yantra and subjected for 3 bhāvanās with 'nimbū swarasa'. After 3rd bhāvanā, the drug is dried well and stored in suitable airtight container as 'śuddha kaṅkuṣṭha'.

As the 2nd line of the verse says, it is not necessary to do 'sattvapātana' of 'kaṅkuṣṭha', because; the drug itself is in the form of sattva (essence).

## Kaṅkuṣṭha- properties:

कङ्कुष्ठं तिक्तकटूकं वीर्योष्णं चातिरेचनम् । व्रणोदावर्तशूलार्तिगुल्मप्लीहगुदार्तिनुत् ॥
(R. R. S. 3/113)

नाशयेदामवातं च रेचयेत् क्षणमात्रतः । कङ्कुष्ठं नाशयेत् शीघ्रं कठोदरजलोदरम् ॥
(Rasajalanidhi)

The 'śuddha kaṅkuṣṭha' possesses tikta kaṭu rasa, uṣṇa vīrya and is a strong purgative. It is useful in healing the wounds, udāvarta roga, different types of śūla, gulma roga, plīha roga and guda roga.

It judicious use cures āmavāta roga and induces strong purgation within no time. It cures kaṭhodara (udara kaṭhinatā; distended abdomen) and jalodara (ascites).

## Kaṅkuṣṭha- administration:

भजेदेनं विरेकार्थं ग्राहिभिर्यवमात्रया । नाशयेदामजार्त्तिं च विरेच्य क्षणमात्रतः ॥ (R. R. S. 3/115)
भक्षितः सह ताम्बूलैर्विरिच्यासून्विनाशयेत् । (R. R. S. 3/116)

To induce virecana, one yava of 'śuddha kaṅkuṣṭha' is administered along with any of the suitable 'grāhī dravya' (śuṇṭhī, jīraka, gajapippalī) in desired ratio. This medicine induces virecana and helps in curing diseases because of 'āma doṣa'.

For strong and quick virecana, one yava of 'śuddha kaṅkuṣṭha' is administered along with 'betel leaf' (tāmbūla patra). One should be careful while administering this medicine, because; induction of severe virecana may be fatal at times due of dehydration.

## Kaṅkuṣṭha- toxicity and measures:

बर्बूरिमूलिकाक्वाथो जीरसौभाग्यकं समम् । कङ्कुष्ठविषनाशाय भूयो भूयः पिबेन्नरः ॥
(R. R. S. 3/117)

In case of any toxicity due to consumption of 'śuddha kaṅkuṣṭha', the person is administered with the 'babbūlamūla kwātha' added with 'jīraka cūrṇa' and 'śuddha ṭaṅkaṇa cūrṇa' until the symptoms subside.

**Kaṅkuṣṭha- few compound formulations:**

1. Dhanvantarī rasa
2. Dhanvantarī ghṛta
3. Śotodarāri rasa
4. Udāvartahara rasa
5. Mṛtasañjīvanī rasa

❋

Chapter 17

# SĀDHĀRAṆA RASA

## 1. KAMPILLAKA

(Mallotus phillippinensis)

**Introduction:**

Kampillaka is the first drug of 'sādhāraṇa rasa' group. It is the drug of herbal origin. It is identified as 'Mallotus phillippinensis'. The general information about this drug is as follows. Mallotus philippensis is a plant in the spurge family.

Occurrence: It occurs in south East Asia, as well as Afghanistan and Australia. The southernmost limit of natural distribution is Mount Keira, south of Sydney.

The species name refers to the type specimen being collected in the Philippines, where it is known as Banato. In India it is found in Bengal, Gujarat, northern parts of Karnataka, Malabar hills and in Chennai region.

Mallotus phillippinensis is a bush to small or medium sized tree, up to 25 meters tall and a trunk diameter of 40 cm. Its flowering season is March to April. Fruit may appear at any time of the year, three months or so after flowering.

Usually a three lobed capsule, 6 to 9 mm broad, covered in red powdery substance. This is soluble in alcohol, which produces a golden red dye suited to colouring of silk and wool. This red powder is collected and used as 'kampillaka' for pharmaceutical as well as therapeutic purposes.

**Kampillaka- description:**

इष्टिकाचूर्णसङ्काशश्चन्द्रिकाढ्योऽतिरेचनः । सौराष्ट्रदेशे चोत्पन्नः स हि कम्पिल्लकः स्मृतः ॥

(R. R. S. 3/122)

The red brick powder like 'phala raja' around the fruits of kampillaka is used as 'kampillaka' for medicinal purposes. It is a strong purgative and this plant grows in 'Sourashtra' (Gujarat) region.

**Kampillaka- brief history:**

It is a herbal drug used for therapeutic purposes since Saṁhitā period. Its use is found in many places of 'Caraka Saṁhitā', 'Suśruta Saṁhitā' and 'Aṣṭāṅga

Hṛdaya'. Since it is useful in pharmaceutical procedures of 'mercury', it has been included in 'uparasa' group.

### Kampillaka- synonyms:

Raktacūrṇaka, recaka, karkaśa, rocana, raktāṅga and candra; are the synonymous words with which this drug is identified in classics.

### Kampillaka- adulteration:

Market sample of kampillaka usually comes with 'brick powder' as adulterant as the brick powder looks similar as that of kampillaka. If so, the sample will be heavier than desired.

### Kampillaka- tests of genuineness:

The genuineness of the 'kampillaka' sample is tested as said below;

1. It will be soft to touch.
2. It floats when put on stable water.
3. It is insoluble in cold water but is soluble in warm or hot water.
4. When touched with wet fingertip and rubbed over a white paper, it leaves yellow colour.
5. When a pinch of the drug is put on fire, it burns with sound.

### Kampillaka- śodhana:

The market sample of kampillaka is poured into a wide mouthed vessel containing stable water. The genuine kampillaka floats and the brick powder sinks in water. The floating kampillaka is collected, dried and stored as 'śuddha kampillaka' for further pharmaceutical or therapeutic use.

### Kampillaka- properties:

पित्तव्रणाध्मानविबन्धहारी श्लेष्मोदरार्तिकृमिगुल्महारी ।
मूलामशोफज्वरशूलहारी कम्पिल्लको रेच्यगदापहारी ।। (R. R. S. 3/123)

Kampillaka possesses kaṭu and alpa amla rasa and uṣṇa vīrya. It is a strong virecaka and malabhedaka. It is indicated in pittaja roga, vraṇa, ādhmāna, vibandha (constipation), kaphaja, udara roga, udara krimi, gulma roga, arśa roga, jwara, different types of śūla and all the diseases cured by virecana.

### Kampillaka- few compound formulations:

1. Kampillaka malahara
2. Paṭolādi cūrṇa
3. Kṛmighātinī guṭikā
4. Triphalādi ghṛta
5. Bindu ghṛta
6. Brahma ghṛta

## 2. GOURĪPĀṢĀṆA

(Arseneous trioxide; $As_2O_3$)

### Introduction:

Gourīpāṣāṇa is the second mineral drug of sādhāraṇa rasa group. It is a arsenic compound. It is identified as 'White Arsenic' or 'Vitreous' in English. Chemically the drug is 'Arseneous trioxide'.

Arsenic trioxide is the inorganic compound with the formula $As_2O_3$. Arsenic trioxide can be generated via many routine processing of arsenic compounds including the oxidation (combustion) of arsenic and arsenic-containing minerals in air. Illustrative is the roasting of orpiment, a typical arsenic sulfide ore; $2\ As_2S_3 + 9\ O_2 \rightarrow 2\ As_2O_3 + 6\ SO_2$.

### Medical utility:

Despite the well-known toxicity of arsenic, arsenic trioxide has long been of biomedical interest, dating to traditional Āyurvedic and Chinese medicine. It is still used to treat cancer and other conditions.

Arsenic trioxide under the trade name Trisenox (Manufacturer: Cephalon) is a chemotherapeutic agent of idiopathic function used to treat leukemia that is unresponsive to "first line" agents. It is suspected that arsenic trioxide induces cancer cells to undergo apoptosis.

Due to the toxic nature of arsenic, this drug carries significant risks. Used as a cytostatic in the treatment of refractory promyelocytic (M3), subtype of acute myeloid leukemia.

Arsenic trioxide also appears to be a promising therapeutic agent for autoimmune diseases. The enzyme thioredoxin reductase has recently been identified as a target for arsenic trioxide.

Arsenic trioxide in combination with ascorbic acid and buthionine sulfoxide decreases intracellular glutathione to a greater extent and renders malignant cells more sensitive to apoptosis.

Arsenic trioxide induced apoptosis was not enhanced by ascorbic acid in normal cells, suggesting that this combination may be selectively toxic to some malignant cells.

### Occurrence:

The ores of this mineral are found in European countries and parts of China. In India it is found in Bihar and Kashmir along with ores of Iron pyrite.

### Properties:

| | |
|---|---|
| Identified as | White Arsenic or Vitreous |
| Chemical name | Arseneous trioxide |
| Chemical formula | $As_2O_3$ |
| Lethal dose | 125 to 250 mgs of unpurified arsenic will be lethal to humans |
| Solubility | Soluble in water but in very small quantities |
| When exposed to intense heat | Sublimes with garlic odour |

### Gourīpāṣāṇa- synonyms:

शंखमूषं शंखविषं गौरीपाषाणकं तथा । दारुमूषं दारुमूषा दारुमोचश्च मल्लकः ॥
फेनाश्मभस्मसंज्ञश्च सोमलः सम्बलं तथा । आखुपाषाणकं चैव रसज्ञैः परिकीर्तितम् ॥

(R. T. 11/130-131)

Śaṅkhamūṣā, śaṅkhaviṣa, gourīpāṣāṇaka, dārumūṣā, dārumoca, mallaka, phenāśma bhasma, somala, sambala and ākhupāṣāṇa; all these are the synonymous words used for the drug 'gourīpāṣāṇa' (Arseneous trioxide; $As_2O_3$).

### Gourīpāṣāṇa- brief history:

This drug is mentioned for the first time in 'Suśruta Saṁhitā'. From then on, it has been used in all the 'cikitsā grantha' of Āyurveda. With evolution of 'Rasaśāstra', this mineral was extensively studied and used. Since it is helpful in 'pārada bandhana', it has been categorized under 'sādhāraṇa rasa' group.

### Gourīpāṣāṇa- types:

- Acc to Rasaratnasamuccaya:

गौरीपाषाणकः पीतो विकटो हतचूर्णकः । स्फटिकाभश्च शङ्खाभो हरिद्राभस्त्रयः स्मृताः ॥
पूर्वः पूर्वो गुणैः श्रेष्ठः ।

(R. R. S. 3/124)

| Types | Colour | Śreṣṭhatwa |
|---|---|---|
| 1. Sphaṭikābha | Śweta varṇa (white) | Śreṣṭhatama |
| 2. Śaṅkhāba | Pāṇḍura varṇa (pale white) | Śreṣṭhatara |
| 3. Haridrābha | Pīta varṇa (yellow) | Śreṣṭha |

- Acc to Rasataraṅgiṇī:

मल्लस्तु द्विविधः प्रोक्तः श्वेतोऽन्यो रक्तकस्तथा । कृत्रिमः श्वेतमल्लस्तु रक्तश्चाकरसंभवः ॥

(R. T. 11/132)

| Types | Origin |
|---|---|
| 1. Śweta gourīpāṣāṇa | Kṛtrima (Artificial) |
| 2. Rakta gourīpāṣāṇa | Naisargika (Natural) |

- Acc to Āyurveda Prakāśa:

गौरीपाषाणकः प्रोक्तो द्विविधः श्वेतपीतकः । श्वेतः शङ्खसदृक् पीतो दाडिमाभः प्रकीर्तितः ।।
श्वेत कृत्रिमकः प्रोक्तः पीतः पर्वतसम्भवः । विषकृत्यकरौ तौ हि रसकर्मणि पूजितौ ।।

(Āy. Pra. 2/336-337)

| Types | | Origin |
|---|---|---|
| 1. Śweta gourīpāṣāṇa (White Arsenic) | Śaṅkhābha | Kṛtrima (Artificial) |
| 2. Pīta gourīpāṣāṇa (Yellow Arsenic) | Dāḍimābha | Parvata-sambhava (Natural) |

- Market availability:

Practically 'śweta' (white), 'rakta' (red), 'pīta' (yellow) and 'kṛṣṇa' (black); these four varieties of gourīpāṣāṇa are available. Out of all these, the white variety is majorly used for pharmaceutical and therapeutic purposes.

**Gourīpāṣāṇa śodhana- 1st method:**

(गौरीपाषाणकं श्रेष्ठं) कारवेल्लीफले क्षिपेत् । स्वेदयेद्धण्डिकामध्ये शुद्धो भवति मूषकः ।।

(R. R. S. 3/125)

Four to five bigger sized 'bitter gourds' (kāravellī phala) are selected. They are incised from one side and their seeds are removed. Later around 10 gms of roughly pounded 'aśuddha gourīpāṣāṇa' is filled into the belly of each 'bitter gourd' and tied with a thread.

These bitter gourds are tied in a strong cloth like poṭṭalī and hung in 'dolāyantra' with 'kāravellī swarasa' as liquid media. The process of swedana is carried out for one yāma (3 hours) over mild fire.

Later the drug is taken out of bitter gourd's bellies, washed with warm water, dried completely and stored in a suitable container as 'śuddha gourīpāṣāṇa' (Similar reference may be traced from R. T. 11/136).

**Gourīpāṣāṇa śodhana- 2nd method:**

विपाचितं शङ्खविषं यत्नतष्टङ्कणाम्भसा । गव्यदुग्धेन वा यामं शुद्धिमायात्यनुत्तमाम् ।।

(R. T. 11/137)

The roughly pounded 'aśuddha gourīpāṣāṇa' is tied in a strong cloth like poṭṭalī and hung in 'dolāyantra' with 'ṭaṅkaṇa jala' or 'godugdha' (cow's milk) as liquid media.

The process of swedana is carried out for one yāma (3 hours) over mild fire. Later the drug is washed with warm water, dried completely and stored in suitable container as 'śuddha gourīpāṣāṇa'.

- Other references:

The dolāyantra swedana may be carried out 'for a day' using following liquids to purify 'gourīpāṣāṇa';

- With 'meghanāda swarasa' (R. T. 11/133-134).
- With 'aja dugdha' (goat's milk) or 'aja māṁsa rasa' (goat's meat soup) (R. T. 11/135).

**Śuddha gourīpāṣāṇa- properties:**

गौरीपाषाणकः स्निग्धो दोषघ्नो रसबन्धकृत् । कफवातामयहरः वृश्चिकादिविषप्रणुत् ।।
मासमात्रप्रयोगेण श्वासं परमदारुणम् । विविधानि च कुष्ठानि नाशयेन्नैव संशयः ।।
श्लीपदोत्थज्वरध्वंसी प्रकामं कामवर्धनः । सन्धिवातगदद्वेषी फिरङ्गकरिकेशरी ।।
अग्निमान्द्यहरः कामं विषमज्वरनाशनः । कान्तिप्रदः परं जीर्णपाण्डुरोगनिषूदनः ।।
श्वासं प्रतमकं हन्ति चिरोत्थं त्वतिदारुणम् । द्रुतमारम्भवेलायां यक्ष्माणमपि नाशयेत् ।।
हृच्छलजं ज्वरोत्थञ्च हृद्दौर्बल्यं द्रुतं हरेत् । अतीसारं निहन्त्याशु भुक्तमात्रसमुत्थितम् ।।
मल्लो बाह्यप्रयोगेण क्षारकर्मकरः परम् । शोथसन्तापशैथिल्यकरश्च परिकीर्तितः ।।

(R. T. 11/138-144)

Śuddha gourīpāṣāṇa will be snigdha (damp) to touch. It mitigates vāta, pitta and kapha doṣa. It does pārada bandhana. It is beneficial in kapha-vātaja roga. If consumed judiciously for a month it is beneficial in severe śwāsa roga. It is also helpful in all types of kuṣṭha roga and ślīpadajanya jwara.

It improves the person's virility. It cures sandhigata vāta (arthritis), phiraṅga roga (syphilis), agnimāndya (loss of appetite) and viṣama jwara (intermittent fevers). It improves the body radiance, cures chronic anaemia (pāṇḍuroga) and chronic pratamaka śwāsa (dyspnoea).

If rājayakṣma roga is detected in initial stages and treated with this medicine, the disease will be cured. Hṛdaya śūla associated with jwara and hṛdaya dourbalya will be cured with this medicine. It is also beneficial in atisāra roga.

If used for external application, this medicine acts like 'kṣāra'. Its external application alleviates inflammations, burning sensation and local temperature.

Note: The properties of 'haratāla bhasma' and 'śuddha gourīpāṣāṇa' are almost similar.

**Gourīpāṣāṇa- dosage:**

खनेत्रेन्दुमिताद् भागाद् रक्तेरारभ्य यत्नतः । खवह्निभागप्रमितं शङ्खमूषं नियोजयेत् ।।

(R. T. 11/145)

The dosage of 'śuddha gourīpāṣaṇa' is 1/120th rattī (1 mg) to 1/30 rattī (4 mgs). The mātrā has to be finalized after considering the strength of the patient, the disease and all the other factors that influence the dosage.

**Gourīpāṣāṇa- dosage making:**

गुञ्जोन्मितं शङ्खविषं तिथिमाषकसम्मिते । मरिचचूर्णे निक्षिप्य श्रृङ्गवेराम्भसा ततः ।।
खल्वमध्ये निधायाथ मर्दयेत्तु दिनत्रयम् । निर्मापयेत्ततो युक्त्या वटिकां रक्तिकोन्मिताः ।।
एकैकां वटिकाञ्चाथ सायम्प्रातस्ततो भिषक् । वीतशङ्कः प्रयुञ्जीत तत्तद्दोषापनुत्तये ।।
अनेनैव तु मानेन प्रयोगोद्दिष्टभेषजैः । ऐतत्सम्मेल्य निर्माय वटिकादीन् प्रयोजयेत् ।।
(R. T. 11/147-150)

One rattī (125 mgs) of 'śuddha gourīpāṣāṇa' is taken in a clean khalva yantra and added with 15 gms of 'marīca cūrṇa'. The mixture is thoroughly triturated for 3 days by adding required quantity of 'ārdraka swarasa'. Later the pills of one rattī (125 mgs) size are rolled, dried in shade and stored in airtight containers.

One pill in the morning and one in the evening is administered with suitable adjuvant. Similarly, one rattī of 'śuddha gourīpāṣāṇa' may be added with fine powders of any other suitable drug and administered in any dosage form. The added drugs increase the bulk of the medicine and assist the main medicine in therapeutic action.

**Gourīpāṣāṇa dosage making- precautions:**

रक्तिसम्मितमल्लस्य भक्षणात् पुरुषो यतः । यमालयं प्रयातीह सावधानतया ततः ।।
देशकालादिकं वीक्ष्य रोगिणश्च बलाबलम् । मात्रां प्रकल्पयेद्धीरो रसायनचिकित्सकः ।।
(R. T. 11/151-152)

Since one rattī (125 mgs) of 'śuddha gourīpāṣāṇa' administered at once will be fatal to the human life, addition of other drugs to increase bulk of the medicine becomes necessary. However, the dosage of this medicine has to be very cautiously contemplated by considering the factors like, roga-bala, rogī-bala, deśa, kāla etc.

**Gourīpāṣāṇa māraṇa (malla māraṇa):** (R. T. 11/171-176)

In a wide mouthed, clean mud pot, two pala (96 gms) of 'surā kṣāra' is taken. Above that two pala (96 gms) of 'hastidanta cūrṇa' is put. The powders in the middle of the pot are given a conical shape.

The pot is placed over mild fire and heated. When both the drugs placed in the pot become moisture free and vapour free like bhasma, the heating is stopped and the drug inside is collected, triturated and stored in suitable container.

Now two tola (24 gms) of this powder is taken in a small crucible, over that, one tolā (12 gms) of 'śuddha gourīpāṣāṇa' is put and above that again 2 tola of the powder is placed. This crucible is enclosed in a 'śarāva sampuṭa' and subjected for one 'lāvaka puṭa'.

When cool on its own, the white coloured 'malla bhasma' is collected from the crucible. The properties and the dose of this bhasma are similar as that of 'śuddha gourīpāṣāṇa'.

**Gourīpāṣāṇa- toxicity and measures:**

In case of any toxicity due to administration of 'śuddha gourīpāṣāṇa', following measures may be followed (until the symptoms subside). Intake of;

1. Milk + Ghee + Sugar;
2. Butter + Sugar + Tila cūrṇa;
3. The juice of 'bitter gourd'
4. Administered with 'ṭaṅkaṇa jala' .

**Gourīpāṣāṇa- sattvapātana:**

तालवद्ग्राहयेत्सत्त्वं शुद्धं शुभ्रं प्रयोजयेत् । (R. R. S. 3/126)

The 'gourīpāṣāṇa sattvapātana' is similar as that of 'haratāla sattvapātana'. The sattva of 'gourīpāṣāṇa' will also be 'arsenic' and will be bright white in colour.

**Gourīpāṣāṇa- few compound formulations:**

1. Mallasindūra
2. Malla vaṭī
3. Samīrapannaga rasa
4. Sūcikābharaṇa rasa
5. Kālānala rasa
6. Ardhāvabhedaka yoga

## 3. NAVASĀDARA

(Ammonium chloride; $NH_4Cl$)

**Introduction:**

Navasādara is the third mineral drug of sādhāraṇa rasa group. It is chemically identified as 'Ammonium chloride' ($NH_4Cl$). Ammonium chloride, an inorganic compound with the formula $NH_4Cl$. It is a 'white crystalline salt', which is highly soluble in water.

Solutions of ammonium chloride are mildly acidic. Sal ammoniac is a name of the natural, mineralogical form of ammonium chloride. The mineral is commonly formed on burning coal dumps, due to condensation of coal-derived gases.

It is also found around some types of volcanic vent. It is used as a flavouring agent in some types of liquorice. It is the product from the reaction of hydrochloric acid and ammonia.

Ammonium chloride is used as an expectorant in cough medicine. Its expectorant action is caused by irritative action on the bronchial mucosa. This causes the production of excess respiratory tract fluid which presumably is easier to cough up. Ammonium salts are an irritant to the gastric mucosa and may induce nausea and vomiting.

Ammonium chloride is used as a systemic acidifying agent in treatment of severe metabolic alkalosis, in oral acid loading test to diagnose distal renal tubular acidosis, to maintain the urine at an acid pH in the treatment of some urinary-tract disorders.

**Properties:**

| | |
|---|---|
| Occurs as | White crystalline salt (Sal ammoniac) |
| Chemical name | Ammonium chloride |
| Chemical formula | $NH_4Cl$ |
| Used as | An expectorant in cough medicine |
| Solubility | Highly soluble in water |

**Navasādara- synonyms:**

नवसारो नव्यसारस्तथैव नवसादरः । नृसादरो नृसारश्च नरसारश्च कीर्तितः ।।
किट्टक्षारो निगदितस्तथैव नरसादरः । चूलिकालवणं ख्यातं चुल्लिकालवणञ्च तत् ।।

(R. T. 14/1-2)

Navasāra, navyasāra, navasādara, nṛsādara, nṛsāra, narasāra, kiṭṭakṣāra, narasādara and cūlikā lavaṇa; all these are the synonymous words which are used in the classics for 'Ammonium chloride' ($NH_4Cl$).

**Navasādara- brief history:**

Navasādara has no reference in any of the 'bṛhattrayī'. From 8th century on words in the books of 'Rasaśāstra', its name has been featured. Because of its use in pārada-karma, it has been categorized under 'sādhāraṇa rasa' group.

**Occurrence and description:**

It is naturally found in larger quantities in Italy, Sicily and in many parts of Middle Asia. **Artificially** it was prepared by burning the excreta of camel. It was also prepared with urine of camel or humans. It is found in the places where mud bricks are burnt.

As per the references from texts of 'Rasaśāstra', Navasādara is the yellowish white 'kṣāra' obtained after burning woods of two plants named 'karīra' and 'pīlu'. It is also obtained from household ovens where woods are burnt to cook. The salty mud inside the oven is dissolved in water, filtered and the liquid part is evaporated to obtain navasādara. Therefore, navasādara is called as 'cullikā lavaṇa'.

### Navasādara- śodhana:

> नवसारन्तु सलिले त्रिगुणे द्रावयेद्भिषक् । वस्त्रपूतं ततः कृत्वा भाजने स्थापयेत्ततः ।।
> चुल्लिकायां निधायाथ पचेत्तीव्राग्निना भृशम् । जले शुष्के तलस्थञ्च नृसारम् विमलं हरेत् ।।
> (R. T. 14/3-4)

One part of 'aśuddha navasādara' is taken in a clean stainless steel vessel, added with 3 parts of clean water and stirred well. The liquid is filtered once through a clean cloth.

The filtrate is now taken in another clean vessel placed over fire and boiled to evaporate all the liquid part. Later the white fine powder left at the base of the vessel is collected, dried and stored in a suitable airtight container as 'śuddha navasādara'.

### Navasādara- properties:

> नवसारस्त्रिदोषघ्नः स्निग्धः सूक्ष्मो लघुस्तथा । पाचकः सारकस्तीक्ष्णो जठराग्निप्रदीपनः ।।
> उष्णः प्लीहप्रशमनो मांसाजीर्णनिवारणः । गुल्माध्मानप्रहरणः कफविश्लेषणः परम् ।।
> वृश्चिकोत्थविषघ्नश्च लोहद्रावणकस्तथा । हृदामयहरो नेत्र्यः श्वित्रकुष्ठहरस्तथा ।। (R. T. 14/5-7)

Śuddha navasādara, when used judiciously for therapeutic purposes, it mitigates all the 3 doṣas. It possesses snigdha, sūkṣma and laghu guṇa. It is good digestive, strong laxative (pitta-sāraka) and a good appetizer. It possesses uṣṇa vīrya, cures plīha roga and digests the hard foods like māṁsa. It cures gulma roga and udara ādhmāna.

It liquefies the adhered kapha doṣa in respiratory system and improves its function. It brings down the toxic effects of scorpion bite. It is used for 'loha-drāvaṇa' (t liquify the metals and minerals). It is useful in cardiac ailments, diseases of eye, świtra and kuṣṭha roga.

### Navasādara- dosage:

> द्विगुञ्जतश्चाष्टगुञ्जमितं तु नवसादरम् । प्राणाचार्यः प्रयुञ्जीत बलकालाद्यपेक्षया ।। (R. T. 14/8)

Two rattī (250 mgs) to eight rattī (1 gm) is the general dosage of 'śuddha navasādara'. However, the dosage is finalized only after thorough consideration of all the relevant factors.

**Navasādara- sattvapātana:**

विमलं कठिनीचूर्णे तोलकत्रितयोन्मितम् । विशुद्धं नवसारश्च चतुस्तोलकसंमितम् ।।
खल्वे सम्पेष्य यन्त्रे तु पचेड्डमरुकाभिधे । नृसारसत्त्वं विशदमूर्ध्वलग्नं समाहरेत् ।।

(R. T. 14/20-21)

Three tola (36 gms) of 'śuddha khaṭikā' and four tola (48 gms) of 'śuddha navasādara' are triturated together in a clean khalva yantra. The mixture is enclosed in a 'ḍamaru yantra' and subjected to moderate heat for a day.

When cool on its own, the purest form of 'ammonium chloride' is found adhered at the base of the upper pot. It is carefully collected and stored in suitable airtight container as 'navasādara sattva'.

Note: Navasādara sattvapātana is not required as such. Since it is specified in the classics, the explanation is provided here for the perusal of the readers.

**Navasādara sattva- properties:**

नृसारसत्त्वं रुचिदं त्वम्लपित्तहरं परम् । कफविश्लेषणकरं हृद्दौर्बल्यविनाशनम् ।।
वामकं सारकञ्चापि तथा फुफ्फुसशोथहृत् । पाचनं दीपनश्चैव घ्रातं मूर्च्छाहरं मतम् ।।

(R. T. 14/22-23)

Navasādara sattva (purest form of ammonium chloride) when administered internally in suitable dosage, it improves the appetite and cures 'amlapitta'. It liquefies and removes the adhered kapha doṣa. It strengthens the cardiac muscles. If consumed in larger dosage it causes vomiting and purgation.

It is useful in inflammatory conditions of lungs. This medicine is a good digestive and appetizer. Its smell brings back the consciousness of the person suffering with 'mūrcchā'.

**Navasādara sattva- dosage:**

गुञ्जैकतः समारभ्य गुञ्जापञ्चकसंमितम् । नवसादरसत्त्वस्य मात्रा शस्ता भिषग्वरैः ।।
सपादमाषकमिता मात्रा वमनकारिणी । नवसादरसत्त्वस्य भिषग्भिः परिकीर्तिता ।।

(R. T. 14/24-25)

One rattī (125 mgs) to five rattī (625 mgs) is the general dosage of 'navasādara sattva'. If it is consumed in the dosage of 1.25 māṣa (1.25 gms), it causes vomiting. If consumed in further higher dosage, it induces both vomiting and diarrhoea.

**Navasādara sattva- usage:**

नव्यसारभवं सत्त्वं सलिले तु परिस्रुते । द्रावयित्वाऽथे निर्दिष्टरोगेषु तु नियोजयेत् ।।

(R. T. 14/26)

dr.keshav_raj

The 'navasādara sattva' is properly diluted with required quantity of water and carefully used as per the need in appropriate dosage in different disease conditions.

**Navasādara-few compound formulations:**

1. Śweta parpaṭī
2. Kṣāra parpaṭī
3. Śaṅkhadrāvaka (bṛhat)
4. Vṛścikadaṁśahara lepa
5. Rājavallabha rasa
6. Rohitakādya ghṛta

## 4. KAPARDA

(Marine shell or Cowrie)

**Introduction:**

Kaparda or varāṭikā is the fourth mineral drug of sādhāraṇarasa group. It is identified as 'marine shell', 'cowry' or as 'cowrie' in English (plural cowries). Cowrie is the common name for a group of small to large sea snails, marine gastropod molluscs in the family Cypraeidae, the cowries.

The word cowrie is also often used to refer only to the shells of these snails, which overall are often shaped more or less like an egg, except that they are rather flat on the underside.

The shells of cowries are usually smooth and shiny and more or less egg-shaped, with a flat under surface which shows a long, narrow, slit-like opening (aperture), which is often toothed at the edges.

The narrower end of the egg-shaped cowry shell is the anterior end. The spire of the shell is not visible in the adult shell of most species, but is visible in juveniles, which have a different shape than the adults.

Nearly all cowries have a porcelain-like shine, with some exceptions such as Hawaii's granulated cowry, Nucleolaria granulata. Many have colorful patterns. Lengths range from 5 mm for some species up to 19 cm for the Atlantic deer cowry, Macrocypraea cervus.

**Properties:**

| | |
|---|---|
| Identified as | Marine shell or as cowrie |
| Chemical formula | $CaCO_3$ |
| Hardness | Brittle |

**Kaparda (varāṭikā)- synonyms:**

वराटको वराटश्च वराटी च वराटिका । कपर्दकः कपर्दश्च कपर्दी च कपर्दिका ।।
बालक्रीडनकश्चापि चरो वर्यश्चराचरः । वराटकं वराटं च कपर्दं च निगद्यते ।। (R. T. 12/82-83)

Varāṭaka, varāṭa, varāṭī, vatāṭikā, kapardaka, kaparda, kapardī, kapardikā, bālakṛīḍanaka, cara and carācara; all these are the synonymous words with which this drug '**cowrie**' is identified in the classics.

**Kaparda- brief history:**

The knowledge about the therapeutic utility of these marine shells (kaparda) can be traced since the period of 'Caraka Saṁhitā'. Since this drug is useful in 'pārada jāraṇa', it has been included in 'sādhāraṇa rasa' group.

**Kaparda- types:**

- Acc to Rasataraṅgiṇī:

वराटिका त्रिधा प्रोक्ता पीता श्वेता च धूसरा । पीतोत्तमा मध्यमा तु श्वेतान्या त्वधमा मता ।।

(R. T. 12/84)

There are three types of 'varāṭikā' depending on their colour;

| Varāṭikā types | Śreṣṭhatā |
|---|---|
| 1. Pīta varāṭikā (yellowish) | Uttama |
| 2. Śweta varāṭikā (whitish) | Madhyama |
| 3. Dhūsara varāṭikā (Smoky) | Adhama |

- Acc to Rasaratnasamuccaya:

पीताभा ग्रन्थिका पृष्ठे दीर्घवृत्ता वराटिका । रसवैद्यैर्विनिर्दिष्टा सा चराचर संज्ञिका ।।
सार्धनिष्कभरा श्रेष्ठा निष्कभारा च मध्यमा । पादोननिष्कभारा च कनिष्ठा परिकीर्तिता ।।
तदन्ये तु वराटाः स्युर्गुरवः श्लेष्मपित्तलाः ।।

(R. R. S. 3/130-132)

1. Varāṭikā and 2. Varāṭa; are two types of 'varāṭikā'. Their description as given below;

1. Varāṭikā: This variety of varāṭikā comes with yellowish colour. It possesses nodules over its posterior surface and will be oval shaped. It is also called as 'carācara' as it is the shell of a living creature. Depending on the weight, the 'śreṣṭhatā' of varāṭikā is decided as given below;

| Weight of varāṭikā | Śreṣthatā |
|---|---|
| Sārdha Niṣka (1.5 śāṇa; 6 gms) | Śreṣṭha |
| Niṣka (1 śāṇa; 4 gms) | Madhyama |
| Pādona Niṣka (1/4 śāṇa; 2 gms) | Kaniṣṭha |

2. Varāṭa: This variety of kaparda will be lighter in weight. It vitiates kapha and pitta doṣa and it has no therapeutic utility.

**Kaparda- grāhya swarūpa:**

दीर्घवृन्ता स्वर्णवर्णा पृष्ठे च ग्रन्थिला तथा । सार्द्धैकशाणप्रमिता वराटी कथितोत्तमा ।।

शाणोन्मिता मध्यमा स्याच्छाणार्द्धप्रमिताधमा । रसज्ञैरुत्तमैवेह भस्मकर्मणि शस्यते ।।

(R. T. 12/85-86)

The kaparda with 'dīrgha-vṛinta'; with golden coloured posterior aspect having small nodules is good variety of varāṭikā. If the varāṭikās weigh 1.5 karṣa (18 gms), they are 'uttama' variety. If they weigh only one śāṇa (3 gm), they are 'madhyama' variety. In addition, if they weigh only 'half śāṇa' (1.5 gms), they are the 'adhama' variety of varāṭikā.

Considering the above explanation, only the 'uttama' (best) variety of 'varāṭikā' should be collected and used for therapeutic purposes after appropriate purification and incineration.

### Kaparda śodhana- 1st method:

दोलायन्त्रे तु यामैकं काञ्जिकेन वराटिका । स्विन्ना प्रक्षालिता चोष्णवारिणा शुद्धिमाप्नुयात् ।।

(R. T. 12/87)

Kaparda are made into smaller pieces and are tied in a cloth like poṭṭalī. It is hung in a 'dolāyantra' containing 'kāñjī' as liquid media and subjected for swedana of one yāma (3 hours). Later, the drug in the cloth is washed with warm water, dried and stored as 'śuddha varāṭikā'.

### Kaparda śodhana- 2nd method:

अम्लेन केनचिद्वापि दोलायन्त्रे विपाचिता। वराटी याममात्रेण विशुद्ध्यति न संशयः।। (R. T. 12/89)

Kaparda are made into smaller pieces and are tied in a cloth like poṭṭalī. It is hung in a 'dolāyantra' containing 'kāñjī' or 'nimbū rasa' or any other 'amla dravya' as liquid media and subjected for swedana of one yāma (3 hours). Later, the drug in the cloth is washed with warm water, dried and stored as 'śuddha varāṭikā'.

Note: Three hours of dolāyantra swedana may also be done in following liquids to purify kaparda;

- Kulattha kwātha (R. T. 12/88)
- Sajala nimbūkāmla (diluted citric acid) (R. T. 12/90)

### Kaparda māraṇa- 1st method:

वराटिका विशोधिता त्वलातकानले स्थिता । यदा भवेत्तु फुल्लिता मृता तदाशनोचिता ।।

(R. T. 12/94)

अङ्गाराग्नौ स्थिता ध्माता सम्यग् प्रोत्फुल्लिता यदा। स्वाङ्गशीता मृता तां तु पिष्ट्वा सम्यक् प्रयोजयेत्।।

(Āy. Pra. 2/300)

Place the 'śuddha kaparda' over glowing charcoal. When they become brittle and light weighted because of heat, they are collected, triturated and stored as 'varāṭikā bhasma'. The bhasma prepared with this method can be used for all pharmaceutical and therapeutic purposes.

### Kaparda māraṇa- 2nd method:

वराटकांस्तु विमलान् शरावे स्थापयेद्भिषक् । शरावेणापरेणाथ सम्यगाच्छादयेत्ततः ।।
सन्धिलेपं ततः कृत्वा शोषयेदातपे पुनः । करीषाग्नौ पचेत्कामं यत्नतस्तु भिषग्वरः ।।
स्वाङ्गशीतं ममुद्धृत्य खल्वे सञ्चूर्णयेत्ततः । शरदिन्दुनिभं भस्म सर्वयोगेषु योजयेत् ।।

(R. T. 12/91-93)

The 'śuddha varāṭikā' are enclosed in 'śarāva sampuṭa'. The sampuṭa is sealed appropriately and dried. Later it is subjected for one 'gajapuṭa' with dry cow dung cakes.

When cool on its own, the white coloured bhasma (as bright as full moon) inside the sampuṭa is triturated and stored in airtight container as 'varāṭikā bhasma'. This bhasma may be used for all pharmaceutical and therapeutic purposes.

### Kaparda- properties and dosage:

वराटी दीपनी चोष्णा नयनातङ्कहारिणी । कर्णस्रावहरात्यर्थं वह्निमान्द्यविनाशिनी ।।
पक्तिशूलादिशमनी ग्रहणीगजसिंहिका । क्षयस्फोटापहा वृष्या मात्रा रक्तिद्वयोन्मिता ।।

(R. T. 12/95-96)

The 'kaparda bhasma' is a good appetizer. It possesses 'uṣṇa guṇa' and is useful in 'netraroga' and 'karṇa-srāva'. It alleviates 'agnimāndya' and cures all types of 'udara śūla'. It is a good medicine for 'grahaṇī roga', 'kṣaya roga' and sphoṭa (boils) roga. It is a good aphrodisiac.

The general dosage of 'varāṭikā or kaparda bhasma' is two rattī (250 mgs). However, the dosage has to be decided after thorough consideration of all the relevant factors that affect the dosage.

### Kaparda-few compound formulations:

1. Kapardaka rasa
2. Lavaṅgādi vaṭī
3. Hemagarbha poṭṭalī
4. Grahaṇīkapāṭa rasa
5. Pravālapañcāmṛta rasa

## 5. AGNIJĀRA

(Ambergris)

### Introduction:

Agnijāra (Ambergris) is the fifth mineral drug of sādhāraṇarasa group. It is identified as 'Ambergris' in English. It is also called as 'Grey amber'. It is a solid, waxy, flammable substance of a dull grey or blackish color produced in the digestive system of 'sperm whales' as a secretion.

Freshly produced ambergris has a marine, fecal odour. However, as it ages, it acquires a sweet, earthy scent commonly likened to the fragrance of rubbing alcohol without the vaporous chemical astringency. The principle historical use of ambergris was as a fixative in perfumery, though it has now been largely displaced by synthetics.

**Source:**

Ambergris occurs as a biliary secretion of the intestines of the sperm whale and can be found floating upon the sea or in the sand near the coast. It is also sometimes found in the abdomens of whales.

Because the beaks of giant squids have been found embedded within lumps of ambergris, scientists have theorized that the substance is produced by the whale's gastrointestinal tract to ease the passage of hard, sharp objects that the whale might have eaten.

Ambergris is usually passed in the fecal matter. Ambergris that forms a mass too large to be passed through the intestines is expelled via the mouth, leading to the reputation of ambergris as primarily coming from whale vomit.

Ambergris is found in lumps of various shapes and sizes, weighing from 15 g to 50 kg or more. When initially expelled by or removed from the whale, the fatty precursor of ambergris is pale white in color (sometimes streaked with black), soft, with a strong fecal smell.

Following months to years of photo-degradation and oxidation in the ocean, this precursor gradually hardens, developing a dark grey or black color, a crusty and waxy texture, and a peculiar odour that is at once sweet, earthy, marine, and animalic. Its smell has been generally described as a vastly richer and smoother version of isopropanol without its stinging harshness.

In its developed condition, ambergris has a specific gravity ranging from 0.780 to 0.926. It melts at about $62^0$ C to a fatty, yellow resinous liquid; and at $100^0$ C it is volatilized into a white vapor. It is soluble in ether, in volatile and fixed oils.

Classical reference below speaks about 'ambergris' in an unclear way. It says that the drug is 'jarāyu' of a sea creature named 'agninakra'. After the death of the creature, the part floats on to the shore, dries up under sun and becomes 'agnijāra'.

समुदेणाग्निनक्रस्य जरायुर्बहिरुज्झितः । संशुष्को भानुतापेन सोऽग्निजार इति स्मृतः ॥

(R. R. S. 3/135)

**Occurrence:**

Ambergris can be found in the Atlantic Ocean and on the coasts of Brazil, Madagascar, The East Indies, The Maldives, China, Japan, Australia, New Zealand, and The Moluccas islands.

Most commercially collected ambergris comes from The Bahamas in the Caribbean, particularly New Providence. It is also found in coasts of Indian, Andaman and Nicobar Islands and Lakshadweep Islands.

**Properties:**

| | |
|---|---|
| Identified as | Ambergris or Grey amber |
| English name | Ambergris or Grey amber |
| Specific gravity | 0.780 to 0.926 |
| Melting point | $62^{0}$ C |
| Vaporizes at | $100^{0}$ C (white vapors) |
| Solubility | Soluble in volatile and fixed oils |

**Agnijāra- synonyms:**

Agnija, agnigarbha, agniniryāsa, agnijwālā, vaḍavāgnimala, vahnijāra, samudrajarāyu, sindhuphalā and arṇavodbhava; all these are the synonymous words used in the classics for the drug 'agnijāra' (ambergris).

**Agnijāra- brief history:**

There are no references for this drug in any of the 'bṛhattrayī'. Its first reference can be traced from the book 'Rasārṇava', where it is used for the purpose of 'Abhraka drāvaṇa'.

It is mentioned in the books of 'Rasaśāstra' in detail. Since it is useful in pharmaceutical procedures of 'mercury', it is categorized under 'sādhāraṇa rasa varga'.

**Agnijāra- śodhana:**

यदब्धिक्षारसंशुद्धस्तस्माच्छुद्धिर्न हीष्यते ।

(R. R. S. 3/135)

Since the 'agnijāra' stays in alkaline water of sea and dries up under hot sun, it will be purified on its own. Therefore, there is no need to purify the drug again.

### Agnijāra- properties:

स्यादग्निजार: कटुकोष्णवीर्य: तुन्दामयघ्न: कफवातहारी ।
पित्त: प्रद: शोणितसन्निपातशूलादिवातामयनाशकश्च ।। (Ānandakanda Kriyā. 1/233)
अग्निजारस्त्रिदोषघ्नो धनुर्वातादिवातनुत् । वर्द्धनो रसवीर्यस्य दीपनो जारणस्तथा ।।
(R. R. S. 3/136)

अग्निजारूरिति ख्यातं स्पर्शविधी भवेद्रस: । (Rasopaniṣat)

Agnijāra possesses kaṭu rasa and uṣṇa vīrya. It is a good appetizer and āmapācaka. It mitigates vitiated kapha and vāta doṣa. It increases pitta doṣa. It is indicated in raktaja roga, sannipātaja śūla and all other types of vātaja vyādhi.

Agnijāra is 'tridoṣaghna' and is indicated in dhanurvāta. Its judicious use improves rasa and śukta dhātu and is a good appetizer. It is useful in jāraṇa karma of pārada.

Agnijāra is useful in increasing the potency and appetite of mercury. It makes the mercury 'sparśavedhī' (mercury attains the capacity to digest all the metals and minerals that come in contact; in other words, 'improved appetite').

### Agnijāra- dosage and adjuvant:

Quarter to half rattī (31 to 62 mgs) is the accepted general dose of agnijāra. However, the dose has to be decided after considering all the relevant factors that influence the dosage.

Agnijāra may be administered along with honey, ghee, butter or any other suitable adjuvant that mitigates pitta doṣa.

### Agnijāra- few compound formulations:

1. Cintāmaṇī rasa
2. Bṛhat vāta cintāmaṇī rasa
3. Dhātrī rasāyana
4. Vaḍavānala rasa
5. Jaharamoharā vaṭī

## 6. GIRISINDŪRA

(Mercuric oxide)

### Introduction:

Girisindūra is the sixth mineral drug of sādhāraṇa rasa group. Chemically it is identified as 'Mercuric oxide' (HgO). It is a 'red or orange coloured dry mercuric powder' obtained naturally on selected mountain peaks is 'girisindūra'. It is a solid at room temperature and pressure.

The red form of HgO can be made by heating Hg on oxygen at roughly $350^0$ C or by pyrolysis of $Hg(NO_3)_2$. The yellow form can be obtained by precipitation of aqueous $Hg^{2+}$ with alkali. The difference in color is due to particle size.

Mercuric oxide is a toxic substance, which can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion. The substance is an irritatant to the eyes, the skin and the respiratory tract and may have effects on the kidneys, resulting in kidney impairment. In the food chain important to humans, bioaccumulation takes place, specifically in aquatic organisms.

HgO decomposes on exposure to light or on heating above 500$^0$ C. Heating produces highly toxic mercury fumes and oxygen, which increases the fire hazard. Mercuric oxide reacts violently with reducing agents, chlorine, hydrogen peroxide, magnesium (when heated), disulfur dichloride and hydrogen trisulfide. Shock-sensitive compounds are formed with metals and elements such as sulphur and phosphorus.

**Occurrence:**

Red or orange coloured dry mercuric powder obtained naturally on selected mountain peaks is 'girisindūra'. It is also artificially prepared and will be called 'nāgasindūra'.

**Properties:**

| | |
|---|---|
| Identified as | Red oxide of mercury |
| Chemical name | Mercuric oxide |
| Chemical formula | HgO |
| Decomposes | On exposure to light or on heating above 500$^0$ C |
| Solubility | Insoluble in water |

**Girisindūra- synonyms:**

सिन्दूरं गिरिसिन्दूरं महिलाभालभूषणम् । गणेशभूषणञ्चैव तथा श्रृङ्गारभूषणम् ॥
नागजं नागगर्भञ्च तथैव नागरेणुकम् । मङ्गल्यं भालसौभाग्यं तदेव परिकीर्तितम् ॥

(R. T. 21/148-149)

Sindūra, girisindūra, mahilā-bhāla-bhūṣaṇa, śṛṅgāra-bhūṣaṇa, nāgaja, nāgagarbha, nāgareṇuka, māṅgalya, and bhālasoubhāgya; all these are the synonymous words used in the classics for 'girisindūra' (mercuric oxide).

**Girisindūra- types:**

'Girisindūra' is of two types according to 'Rasajalanidhi';

1. Girisindūra (Natural): Red or orange coloured dry mercuric powder obtained naturally in smaller quantities on selected mountain peaks is iden-

tified as 'girisindūra'. Chemically it is identified as 'Mercuric oxide' (HgO).

2. Nāgasindūra (Artificial): It is a compound of lead found in India (Kashmir, Punjab and Rajasthan). It is chemically identified as 'Lead oxide' (PbO).

### Girisindūra- grāhya lakṣaṇa:

अतिसूक्ष्मकणं स्निग्धं गुरु वर्णसमुज्ज्वलम् । मृदुलं विमलञ्चैव सिन्दूरं जात्यमुच्यते ।।

(R. T. 21/150)

The 'girisindūra', which possesses very fine (red or orange coloured dry mercuric powder) particles that are snigdha, guru (heavy), shiney, soft and clean; such a sample is considered fit and selected for pharmaceutical purposes.

### Girisindūra- therapeutic utility:

सिन्दूरं क्षुद्रकुष्ठघ्नं त्वच्यं व्रणविशोधनम् । भग्नसन्धानजननं तथैव व्रणरोपणम् ।।
पामाविचर्चिकासिध्मवीसर्पशमनं परम् । भूतघ्नञ्च विशेषेण रक्तदोषनिषूदनम् ।।

(R. T. 21/151-152)

'Śuddha girisindūra' when used for external application (not used for internal administration as it is toxic), it cures all 13 types of 'kṣudra kuṣṭha'. This drug is good for skin and is a good wound healer.

It is indicated in pāmā, vicarcikā, sidhma and visarpa, which come under 'kṣudra kuṣṭha'. It is a good germicidal (bhūtaghna dravya) and cures all types of 'rakta doṣa'.

### Girisindūra- śodhana, māraṇa and sattvapātana:

This drug is used only for external application. Though used externally for therapeutic purposes, there are no references for 'śodhana', 'māraṇa' or 'sattvapātana' of 'girisindūra' in classics.

### Girisindūra- āmayika prayoga:

आभ्यन्तरः प्रयोगोऽस्य सिन्दूरस्य न दृश्यते । अतो बाह्यप्रयोगार्थं यत्किञ्चिदुपदिश्यते ।।
सिन्दूरं घृतसंयुक्तं लेपाल्लोचनवर्त्मनि । नाशयत्यचिरादेव कण्डूमञ्जननामिकाम् ।।
मध्वाज्यगुग्गुलुगुडयुतसिन्दूरलेपितौ । कामं तु स्फुटितौ पादौ भवतस्तूत्पलप्रभौ ।।

(R. T. 21/153-155)

'Śuddha girisindūra' is not found used for internal administration. Therefore, the drug has to be used for external application along with other suitable drugs.

Śuddha girisindūra is added with required quantity of ghee and applied daily over the eyelids to cure itching of the eyes and the 'añjananāmika'. It is added with desired ratios of honey, ghee, guggulu and guḍa; and the mixture is daily applied over the cracked soles. By doing so, within few days the soles become as soft as 'kamala puṣpa'.

**Agnijāra- few compound formulations:**

1. Sindūrādya malahara
2. Sindūrādya taila

## 7. HIṄGULA

(Cinnabar; Red Sulphide of Mercury; HgS)

**Introduction:**

Hiṅgula is the seventh mineral drug of sādhāraṇarasa group. It is identified as 'cinnabar' in English. Chemically it is 'red sulphide of mercury' (HgS) with 86.2% of mercury and 13.5% of sulphur.

Cinnabar is generally found in a massive, granular or earthy form and is 'bright scarlet' to 'brick red' in color. It occasionally occurs in crystals with a non-metallic adamantine lustre. The hardness of cinnabar is 2 to 2.5, and its specific gravity 8.1.

It has been mined since the 'Neolithic age'. During the 'Roman empire', it was mined both as a pigment and for its mercury content; and it has been the main source of mercury throughout the centuries.

To produce liquid (quicksilver) mercury, crushed cinnabar ore is roasted in rotary furnaces. Pure mercury separates from sulfur in this process and easily evaporates. A condensing column is used to collect the liquid metal, which is most often shipped in iron flasks.

**Occurrence:**

The ores of hiṅgula are found in US, Iran, Spain, Italy, France, Germany and Japan. It is not found in India. However, it can be artificially prepared in laboratories.

**Properties:**

| | |
|---|---|
| Identified as | Cinnabar |
| Chemical name | Sulphide of Mercury red in colour |
| Chemical formula | HgS (Hg- 86.2% & S- 13.5%) |
| Hardness | 2 to 2.5 |
| Specific gravity | 8.1 |
| Solubility | Insoluble in water and acids but dissolves in acquaragia and forms mercuric chloride |

| | |
|---|---|
| On heating | Mercury evaporates and sulphur dioxide is released<br>$HgS + O_2 \rightarrow SO_2 + Hg\uparrow$ |

**Hiṅgula (cinnabar)- synonyms:**

हिङ्गलो हिङ्गुलश्चैव हिङ्गूलं चेङ्गुलाह्वयम् । म्लेच्छं रक्तं सुरङ्गञ्च चित्राङ्गं चूर्णपारदम् ।।
रसोद्भवो रसस्थानं रञ्जनं.कपिशीर्षकम् । रक्तकायो हंसपादो दरदञ्च प्रकीर्तितम् ।। (R. T. 9/1-2)

Hiṅgala, hiṅgula, hiṅgūla, iṅgula, mleccha, rakta, suraṅga, citrāṅga, cūrṇapārada, rasodbhava, rasasthāna, rañjana, kapiśīrṣaka, raktakāya, haṁsapāda and darada; all these are the synonyms of cinnabar used in classics.

**Hiṅgula- brief history:**

Its references may be traced only from the evolution of 'Rasaśāstra'. All the texts of 'Rasaśāstra' deal with this drug in detail.

**Hiṅgula- swarūpa:**

जपाकुसुमवर्णाभं पेषणे सुमनोहरः । महोज्ज्वलो भारपूर्णो हिङ्गुलः श्रेष्ठ इष्यते ।। (R. T. 9/3)

Hiṅgula, which resembles the red colour of 'japā kusuma' (Hibiscus rosa-sinensis), which can be easily triturated, which has shiney appearance and which is heavy; is considered the best variety for therapeutic purposes.

Note: Cinnabar is generally found in a massive, granular or earthy form and is 'brick red' in color. It occasionally occurs in crystals with a non-metallic adamantine lustre. Chemically it is 'red sulphide of mercury' ($HgS$) with 86.2% of mercury and 13.5% of sulphur. The hardness of cinnabar is 2 to 2.5, and its specific gravity 8.1.

**Hiṅgula- types:**

- Acc to Rasataraṅgiṇī:

प्रथमः खनिजोऽन्यस्तु कृत्रिमो हिङ्गुलो मतः । खनिजः खनितो जातः कृत्रिमो रसगन्धजः ।।
(R. T. 9/4)

Hiṅgula is of two types:

1. Khanija hiṅgula
2. Kṛtrima hiṅgula

'Khanija hiṅgula' (natural cinnabar) is obtained from different ores of cinnabar; whereas the 'kṛtrima hiṅgula' (artificial cinnabar) is prepared by taking mercury ($Hg$) and sulphur ($S$) is appropriate ratio and processing them in 'mṛdaṅga yantra'.

- Acc to Rasaratnasamuccaya:

हिङ्गुलः शुकतुण्डाख्यो हंसपादस्तथाऽपरः ।

प्रथमोऽल्पगुणस्तत्र चर्मारः स निगद्यते । श्वेतरेखः प्रवालाभो हंसपादः स ईरितः ।।

(R. R. S. 3/139)

Hiṅgula is of two types:

1. Śukatuṇḍa hiṅgula: This variety possesses the colour of 'parrot beak'. It is also called as 'carmāra hiṅgula'. This variety is comparatively less potent than the other one.
2. Haṁsapāda hiṅgula: This variety possesses the color similar to that of 'pravāla' (coral). It contains whitish lines (of mercury) over its body. This variety is comparatively more potent than the other one.

- Acc to Āyurveda Prakāśa:

दरदस्त्रिविधः प्रोक्तश्चर्मारः शुकतुण्डकः । हंसपादस्तृतीयः स्याद् गुणवानुत्तरोत्तरः ।।
चर्मारः शुकवर्णः स्यात्सपीतः शुकतुण्डकः । जपाकुसुमसङ्काशो हंसपादो महोत्तमः ।।

(Āy. Pra. 2/71)

Hiṅgula is of three types:

1. Carmāra hiṅgula: This variety possesses the colour of 'parrot beak' (black as per below reference). This variety is comparatively less potent than the other two.
2. Śukatuṇḍa hiṅgula: This variety possesses yellowish colour. This variety is more potent than the earlier one but less potent than the later.
3. Haṁsapāda hiṅgula: This variety possesses red colour of 'japā kusuma'. This variety is most potent in comparison with the other two.

Note: Similar opinion is expressed by another rare reference provided below;

चर्मारः कृष्णवर्णः स्यात् सुपीतः शुकतुण्डकः । जपाकुसुमसङ्काशो हंसपादो महोत्तमः ।।

(Purandara-rahasya)

**Hiṅgula types- tabular representation:**

| Acc to Rasataraṅgiṇī | Acc to Rasaratnasamuccaya | Acc to Āyurveda Prakāśa |
|---|---|---|
| 1. Khanija hiṅgula<br>2. Kṛtrima hiṅgula | 1. Śukatuṇḍa hiṅgula<br>2. Haṁsapāda hiṅgula | 1. Carmāra hiṅgula<br>2. Śukatuṇḍa hiṅgula<br>3. Haṁsapāda hiṅgula |

**Hiṅgula śodhana- necessity:**

अशुद्धो हिङ्गुलो मोह प्रमेहं चित्तविभ्रमम् । आन्ध्यं क्लमं तथा क्षैण्यं कुर्यात्तस्माद्विशोधयेत् ।।

(R. T. 9/11)

अंशुद्धो दरदः कुर्यादान्ध्यं क्षैण्यं क्लमं भ्रमम । मोहं मेहं च संशोध्यस्तस्माद् वैद्यैस्तु हिङ्गुलः ।।

(Āy. Pra. 2/73)

Administration of 'aśuddha hiṅgula' may result in moha (psychosis), prameha roga (diabetes mellitus), citta-vibhrama (delirium), andhatwa (darkness before eyes). klama (tiredness) and śarīra kṣīṇatwa (emaciation).

Therefore, the cinnabar should be properly purified before it is put to judicious therapeutic use.

Note: Similar opinion is expressed by the second reference given above.

### Hiṅgula śodhana- 1st method:

निम्बूकस्वरसेनेह हिङ्गुलं श्लक्ष्णचूर्णितम् । विभावयेत्सप्तवारं क्षालयेद्बहुशोऽम्भसा ।। (R. T. 9/16)

The 'aśuddha hiṅgula' is taken in a clean khalva yantra and triturated to obtain fine powder. This powder is subjected for 7 bhāvanās with 'nimbū swarasa'. The dry powder obtained after 7th bhāvanā is washed with warm water, dried and stored in suitable airtight container as 'śuddha hiṅgula'.

### Hiṅgula śodhana- 2nd method:

हिङ्गुलं चूर्णितं खल्वे शृङ्गवेराम्भसा ततः । सप्तधा भावयेत्प्राज्ञो निर्मलो हिङ्गुलो भवेत् ।।
(R. T. 9/12)

The 'aśuddha hiṅgula' is taken in a clean khalva yantra and triturated to obtain fine powder. This powder is subjected for 7 bhāvanās with 'ārdraka swarasa'. The dry powder obtained after 7th bhāvanā is washed with warm water, dried and stored in suitable airtight container as 'śuddha hiṅgula'.

### Hiṅgula śodhana- 3rd method:

मेषीक्षीरेण दरदं निम्बूनीरेण भावितम् । सप्तवारं प्रयत्नेन शुद्धिमायाति निश्चितम्।। (Āy. Pra. 2/74)

The 'aśuddha hiṅgula' is taken in a clean khalva yantra and triturated to obtain fine powder. This powder is subjected for one bhāvanā with 'sheep's milk' followed by 7 bhāvanās with 'ārdraka swarasa'. The dry powder obtained at the end is washed with warm water, dried and stored in suitable airtight container as 'śuddha hiṅgula'.

### Hiṅgula śodhana- 4th method:

सप्तकृत्वाऽऽर्द्रकद्रावैर्लकुचस्याम्बुनाऽथवा । शोषितो भावयित्वाऽथ निर्दोषो जायते खलु ।।
(R. R. S. 3/142)

The 'aśuddha hiṅgula' is taken in a clean khalva yantra and triturated to obtain fine powder. This powder is subjected for 7 bhāvanās either with 'ārdraka swarasa' or with 'lakuca swarasa'. The dry powder obtained at the end is washed with warm water, dried and stored in suitable airtight container as 'śuddha hiṅgula'.

### Śuddha hiṅgula- properties:

लोचनामयहरः कफापहः वित्तजामयनिषूदनः परम् ।
प्लीहकुष्ठगरकामलाहरो जाठराग्निजननोऽथ पाचनः ।।
मेहवर्गपरितापनाशनो देहकान्तिबलबुद्धिवर्द्धनः ।
आमवातगजदर्पखण्डनो हिङ्गुलो विजयते ज्वरापहः ।।

(R. T. 9/18-19)

Śuddha hiṅgula, when judiciously used in the form of suitable compound formulation and in proper dosage, it will be beneficial in all types of eye diseases. It mitigates vitiated kapha-doṣa and cures many of the pittaja roga. It cures plīha roga (splenic disorders), kuṣṭha roga (skin diseases); nullifies the influence of gara-viṣa and cures kāmalā roga (jaundice).

It improves the appetite and digests āma-doṣa. It is a good medicine in tackling all types of 'prameha roga' (diabetes). Its appropriate use imparts good radiance to the body. It improves good physical strength and intellect. It wins over āmavāta (arthritis) and jwara (fever).

- Another reference:

हिङ्गुलः सर्वदोषघ्नो दीपनोऽतिरसायनः । सर्वदोषहरो वृष्यो जारणायातिशस्यते ।।
एतस्मादाहृतः सूतो जीर्णगन्धसमो गुणैः ।

(R. Cū. 11/108-109)

Śuddha hiṅgula, when judiciously used in suitable form and dosage, it mitigates all the three vitiated doṣas. It is a good appetizer, rejuvenator and aphrodisiac. It is useful in pārada jāraṇa saṁskāra. The mercury extracted from cinnabar (hiṅgulottha pārada) possesses all the properties of gandhaka jārita pārada.

### Śuddha hiṅgula- dosage and adjuvant:

Half to one rattī (62 to 125 mgs) is the general dose of 'śuddha hiṅgula'. It may be administered along with 'marīca cūrṇa' + 'guḍa' or with 'pippalī cūrṇa' + 'guḍūcī swarasa' or with honey.

Note: However, administration of 'śuddha hiṅgula' alone as medicine is rarely seen. It usually goes as an ingredient in many compound formulations.

**Hiṅgula sattvapātana:** (Hiṅgulākṛṣṭa rasa or Hiṅgulottha pārada)

(I) Adhaḥpātana method:

दरदः पातनायन्त्रे पातितश्च जलाशये । तत्सत्त्वं सूतसङ्काशं जायते नात्र संशयः ।। (R. R. S. 3/144)

The required quantity of 'śuddha hiṅgula' is taken in a clean khalva yantra and triturated with required quantity of 'nimbū swarasa', 'ārdraka swarasa' or 'lakuca swarasa' to prepare paste of the same.

This paste is neatly applied at the inner surface of the upper pot of 'adhaḥpātana yantra'. In the lower pot (which has been buried in earth with only neck above), enough quantity of water is taken. The hiṅgula paste applied pot is placed inverted over the buried pot and the mouths are sealed.

From above the dry cow dung cakes are heaped up and ignited to apply moderate heat of 3 prahara (9 hours). By doing so, the 'pārada' from the base of the upper pot, gradually trickles down and gets collected at the base of the lower pot (in water).

Later, the yantra is allowed to cool down overnight on its own. Next morning pots are separated and 'hiṅgulottha pārada' at the base of the lower pot in the water is cautiously collected. This mercury will be free from all the 'saptakañcuka' doṣas and does not require any of the 'śodhana' or 'saṁskāra'.

(II) Ūrdhvapātana method:

ऊर्ध्वपातनयन्त्रेण हिङ्गुलादुत्थितो रसः। हिङ्गुलोत्थः स्मृतिश्चैव हिङ्गुलाकृष्ट उच्यते ॥ (R. T. 2/31)

The required quantity of 'hiṅgula' is taken in a clean khalva yantra and subjected for 7 bhāvanās each with desired quantity of 'nimbū swarasa', 'ārdraka swarasa' or 'lakuca swarasa' to purify hiṅgula.

Later the dry hiṅgula powder is taken in lower pot of a clean 'ūrdhva-pātana yantra' and subjected for heat (boiling point of mercury 357.25$^0$ C). Wet cloth is placed over the top of upper pot. The evaporated mercury gets collected at the inner surface of the pot in tiny droplets form. Later when complete evaporation is done, the mercury is collected from upper pot, washed and used as 'hiṅgulottha pārada' or 'hiṅgulākṛṣṭa rasa'.

Pārada extracted from hiṅgula is considered purest of all forms. Therefore, it does not require any further purification. Another reference of ūrdhvapātana method is as given below;

विद्याधराख्ययन्त्रस्थादार्द्रकद्रवमर्दितात् । समाकृष्टो रसो योऽस्यौ हिङ्गुलाकृष्ट उच्यते ॥
(R. R. S. 8/39)

## Hiṅgula- few compound formulations:

1. Hiṅguleśwara rasa
2. Ānandabhairava rasa
3. Tribhuvanakīrti rasa
4. Kastūrībhairava rasa
5. Jwaramurārī rasa
6. Vasantamālatī rasa
7. Darada vaṭī
8. Rasagarbha poṭṭalī rasa
9. Kanakasundara rasa
10. Hiṅgulādya malahara

## 8. MṚDDĀRAŚṚṄGA

(Litharge; Lead monoxide; PbO)

### Introduction:

Mṛddāraśṛṅga is the eighth mineral drug of sādhāraṇa rasa group. It is identified as 'litharge' in English. Chemically it is 'Lead monoxide' (PbO). **Litharge** is one of the yellow coloured natural mineral forms of lead oxide, PbO.

It forms as coatings and encrustations with internal tetragonal crystal structure. It is dimorphous with the orthorhombic form massicot. It forms soft (with hardness of 2), red, greasy-appearing crusts with a very high specific gravity of 9.14 to 9.35.

Historically, the term "litharge" has been combined to refer to other similar substances. For example, litharge of gold is 'litharge mixed with red lead', giving it a red color; litharge of silver is litharge that comes as a by-product of separating silver from lead; litharge of bismuth is a similar result of the oxidation of bismuth. The term has also been used as a synonym for white lead or red lead.

**Lead oxide** is the inorganic compound with the formula PbO. Lead oxide occurs in two polymorphs, red, having a tetragonal crystal structure and yellow, having an orthorhombic crystal structure. Both forms occur naturally as rare minerals---the red form is known as litharge and the yellow form is known as massicot.

Lead oxide may be fatal if swallowed or inhaled. It causes irritation to skin, eyes, and respiratory tract. It affects gum tissue, central nervous system, kidneys, blood, and reproductive system. It can bioaccumulate in plants and in mammals.

### Occurrence:

As per classical references, the drug was found in parts of Gujarat and in Mount Abu. However, presently it is not found in India. It has been imported from countries like Myanmar and China.

### Properties:

| | |
|---|---|
| Identified as | Litharge, a compound of lead and oxygen |
| Chemical name | Lead monoxide |
| Chemical formula | PbO |
| Hardness | 2 |

| | |
|---|---|
| Specific gravity | 9.14 to 9.35 |
| Solubility | Insoluble in water, but dissolves in mild but warm sulphuric acid |

### Mṛddāraśṛṅga- synonyms:

मृद्दारशृङ्गकञ्चैव मतं वोदारशृङ्गकम् । मुर्दाशङ्खं तथा मुद्रशङ्खकञ्च निगद्यते ॥ (R. T. 21/165)

Mṛddāraśṛṅga, bodāraśṛṅga, murdāśaṅkha and murdāśaṅkhaka; all these are used as synonymous words for the drug 'mṛddāraśṛṅga' (Lead monoxide; PbO).

### Mṛddāraśṛṅga- brief history:

Mṛddāraśṛṅga has been in use since the period of 'Rasaśāstra' (8th or 9th century onwards). Because of its assistance in the pharmaceutical procedures of mercury, it has been categorized under 'sādhāraṇa rasa varga'. Earlier to the period of 'Rasaśāstra', this drug has no references.

### Mṛddāraśṛṅga- types:

(I) Two types based on origin;
  1. Khanija (Natural)
  2. Kṛtrima (Artificial)

(II) Two types based on colour (Āy. Pra. 2/343-344);
  1. Pīta mṛddāraśṛṅga (yellowish) (grāhya);
  2. Pāṇḍura mṛddāraśṛṅga (pale white); (agrāhya);

(III) Two types base on structure (R. T. 21/166 & Āy. Pra. 2/343-344);
  1. Sadala pīta mṛddāraśṛṅga (with layers); Grāhya Possesses yellowish lustre on its body; comes with layers; yields 'lead' as its 'sattva'; comes with rough surface; and considerable weight; all these are the 'grāhya lakṣaṇas' of mṛddāraśṛṅga.
  2. Nirdala pīta mṛddāraśṛṅga (without layers); (agrāhya);

- References:

बोदारशृङ्गकं प्रोक्तं द्विविधं पीतपाण्डुरम् । सदलं निर्दलं तस्य जनिगुर्जरमण्डले ॥
अर्बुदाख्यगिरेः पार्श्वे सीससत्त्वं स्मृतं परम् । (Āy. Pra. 2/343-344)

मृद्दारशृङ्गं पीताभं सदलं निर्दलं तथा । सीसगर्भं खरस्पर्शं गुरु चैव प्रकीर्तितम् ॥ (R. T. 21/166)

### Mṛddāraśṛṅga- śodhana:

मृद्दारशृङ्गमानीय कुट्टयेत् खल्वमध्यगम् । प्रस्तरांशं परित्यज्य पेषयेदतियत्नतः ॥
वस्त्रपूतं ततः कृत्वा पुनः सुविमलाम्भसा । पेषयेत्पक्षमेकं तु ततो घर्मे विशोषयेत् ॥
मृद्दारशृङ्गकं काममेतद्विधिविशोधितम् । क्षतेऽवचूर्णनाद्यर्थं युञ्जीत भिषजां वरः ॥
(R. T. 21/167-169)

swarasa'. Later the foils are dried, enclosed in 'śarāva sampuṭa' and subjected for one 'kukkuṭa puṭa'.

The entire process is repeated ten times to subject the drug for 10 'kukkuṭa puṭa'. After 10th puṭa, the appropriately prepared 'swarṇa bhasma' with 'campaka varṇa' (yellowish) is collected and stored in suitable airtight container as 'swarṇa bhasma'.

**Swarṇa māraṇa- 3rd method:**

> द्रुते विनिक्षिपेत्स्वर्णे लोहमानं मृतं रसम् । विचूर्ण्य लुङ्गतोयेन दरदेन समन्वितम् ।।
> जायते कुङ्कुमच्छायं स्वर्णं द्वादशभिः पुटैः ।
> (R. R. S. 5/16)

One part of 'śuddha swarṇa' is melted in a crucible. It is added with one part of 'rasa bhasma' (rasasindūra) and mixed. This mixture is taken in a khalva yantra and added with 2 parts (equal to the mixture) of 'śuddha hiṅgula' and triturated.

This mixture is now added with required quantity of 'nimbū swarasa' and triturated to prepare 'cakrikās' of even size. These 'cakrikās' are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'kukkuṭa puṭa'

All this process is repeated ten times to subject the drug for 12 'kukkuṭa puṭa'. After 12th puṭa, the appropriately prepared 'swarṇa bhasma' with 'campaka varṇa' (yellowish) is collected and stored in suitable airtight container as 'swarṇa bhasma'.

**Swarṇa māraṇa- 4th method:**

> शुद्धेषु स्वर्णपत्रेषु समानं शुद्धपारदम् । दत्त्वा सम्पेषयेदम्लैः सुचिरं क्षालयेत्ततः ।।
> संशोष्य गन्धकं दत्त्वा पुटेत्पुटविधानवित् । एवं चतुर्दशपुटैः सुवर्णं मृतिमाप्नुयात् ।।
> षोडशांशं प्रतिपुटं रसेशं ह्रासयेद् बुधः । अन्यथा पञ्चतां नैति रहस्यमिति दर्शितम् ।।
> (R. T. 15/59-61)

One part of 'śuddha swarṇa patra' (thin foils of gold) are cut into smaller pieces with a scissor and taken in a clean khalva yantra. It is added with equal quantity of 'śuddha pārada' and triturated thoroughly until all the gold is digested in mercury. The amalgam formed is added with required quantity of 'nimbū swarasa' and thoroughly triturated again. Later it is washed with warm water to remove all the sourness.

The amalgam is again taken in khalva yantra, added and triturated with one part of 'śuddha gandhaka'. The fine powder (kajjalī) is enclosed in 'śarāva sampuṭa' and subjected for one laghupuṭa. When cool on its own, the drug material inside the sampuṭa is taken back in khalva yantra, added again with 'śuddha gandhaka', enclosed in 'śarāva sampuṭa' and subjected for another laghupuṭa. Like this, 14 puṭa are applied to obtain a perfect, lustre free 'bhasma' of gold.

**Swarṇa māraṇa- 5th method:** (R. T. 15/45-48)

One karṣa (12 gms) of 'śuddha swarṇa' is taken in a strong crucible (mūṣā) of suitable size. This crucible is firmly placed over the glowing charcoal and the heat is intensified to melt the gold by blowing with air blower (vaṅkanāla) from beneath.

When the entire gold melts, it is added with one karṣa (12 gms) of 'rasasindūra' and the crucible is taken out from fire. This molten mixture is taken in a clean khalva yantra; added with required quantity of 'nimbū swarasa' and thoroughly triturated to obtain the mixture in fine powder form.

This powder is now added with one karṣa (12 gms) of 'śuddha hiṅgula cūrṇa' and triturated homogenously. This mixture is now enclosed in 'śarāva sampuṭa' and subjected for 'kukkuṭa puṭa'.

Like this after application of 12 number of 'kukkuṭa puṭa', it will yield soft, non-lustrous and kuṅkuma varṇa bhasma of gold. It is later stored in suitable airtight containers for further therapeutic use.

Note: For 2nd puṭa and for consecutive 12 puṭa, the gold bhasma obtained after 'previous puṭa' is added with one karṣa (12 gms) of 'śuddha hiṅgula cūrṇa', triturated homogenously, enclosed in 'śarāva sampuṭa' and subjected for another 'kukkuṭa puṭa'.

**Swarṇa māraṇa- 6th method:** (R. T. 15/49-52)

One karṣa of 'śuddha swarṇa' is taken in a clean khalva yantra. It is added with equal quantity of 'śuddha pārada' and triturated thoroughly until all the gold is digested in mercury. The amalgam formed is added with required quantity of 'nimbū swarasa' and thoroughly triturated again. Later it is washed with warm water to remove all the sourness.

The amalgam is again taken in khalva yantra and added with one karṣa (12 gms) each of śuddha hiṅgula, śuddha gandhaka, śuddha manaḥśilā and navasādara. Required quantity of nimbū swarasa is also added and triturated thoroughly to obtain a perfect mixture. Later, this mixture is dried under sun to obtain it in the form of 'dry powder'.

This powder mixture is enclosed in 'śarāva sampuṭa' and subjected for one laghupuṭa. When cool on its own, the drug material inside the sampuṭa is taken back in khalva yantra, added again with above said drugs (śuddha hiṅgula, śuddha gandhaka, śuddha manaḥśilā and navasādara) and triturated. The mixture is again enclosed in 'śarāva sampuṭa' and subjected for another laghupuṭa.

Like this, the application of puṭa is continued until a perfect, lustre free 'bhasma' of gold is formed. Roughly around 8 to 10 number of puṭa may be required here to obtain appropriate 'swarṇa bhasma'.

**Swarṇa māraṇa- 7th method:** (R. T. 15/53-58)

One karṣa of 'śuddha swarṇa patra' (thin foils of gold) are cut into smaller pieces with a scissor and taken in a clean khalva yantra. It is added with equal quantity of 'śuddha pārada' and triturated thoroughly until all the gold is digested in mercury. The amalgam formed is added with required quantity 'nimbū swarasa' and thoroughly triturated again. Later it is washed with warm water to remove all the sourness.

The amalgam is again taken in khalva yantra. It is added and triturated with one karṣa (12 gms) each of śuddha manaḥśilā and rasasindūra and one śāṇa (3 gms) of 'swarṇa mākṣika bhasma'. Now, required quantity of 'arka swarasa' is also added and triturated thoroughly to obtain a perfect mixture. Later, this mixture is dried under sun to obtain it in the form of 'dry powder'.

This powder mixture is enclosed in 'śarāva sampuṭa' and subjected for one laghupuṭa. When cool on its own, the drug material inside the sampuṭa is taken back in khalva yantra, added again with śuddha manaḥśilā and rasasindūra (excluding swarṇa mākṣika bhasma) and triturated. The mixture is again enclosed in 'śarāva sampuṭa' and subjected for another laghupuṭa.

Like this, the application of puṭa is continued until a perfect, lustre free 'bhasma' of gold is formed. Roughly around 8 to 10 number of puṭa may be required here to obtain appropriate 'swarṇa bhasma'.

Note: The swarṇa mākṣika bhasma is added only for the first puṭa. For consecutive puṭa, the 'śuddha manaḥśilā' and 'rasasindūra' are added.

**Swarṇa bhasma- chemical assay:**

The chemical assay of the 'gold bhasma' prepared by following strict classical procedures reveal the following contents in it;

| | | |
|---|---|---|
| Gold (as aurum) | : | 96.760 % |
| Silica | : | 1.140 % |
| Lime | : | 0.546 % |
| Phosphate | : | 0.781 % |
| Potash | : | 0.161 % |
| Sulphate | : | 0.150 % |
| Iron | : | 0.140 % |
| Sodium chloride | : | 0.078 % |
| Cooper | : | Trace |
| Magnesia | : | Trace |
| Moisture | : | 0.244 % |

**Apakwa swarṇa bhasma- doṣa:**

बलञ्च वीर्यं हरेत् नराणां रोगव्रजं कोपयतीव काये ।
असौख्यकारं च सदैव हेमापक्वं सदोषं मरणं करोति ॥ (R. R. S. 5/19)

The use of improperly incinerated gold (apakwa swarṇa bhasma) for internal administration will deplete bala (physical strength) and vīrya (virility). It causes many diseases in the body and may eventually kill the patient.

**Swarṇa bhasma- dosage:**

समारभ्याष्टमाद् भागाद् रक्तिकायां भिषग्वरः । योजयेत्तुर्यभागान्तं मृतं स्वर्णं तु कालवित् ॥
(R. T. 15/81)

One-eighth (1/8th) of a rattī (15.6 mgs) to 1/4th of a rattī (31.2 mgs) is the general dosage of 'swarṇa bhasma'. However, the dosage is finalized after thorough consideration of all the relevant factors.

**Swarṇa bhasma sevana- adjuvant:**

एतद्भस्मं सुवर्णजं कटु घृतोपेतम् । (R. Cū. 14/22)

The appropriate dosage of 'swarṇa bhasma' may be administered along with 'marīca cūrṇa + ghṛta', 'trikaṭu cūrṇa + ghṛta' or with any other suitable adjuvant.

**Swarṇa bhasma- special adjuvant and its benefits:**

मत्स्यपित्तस्य योगेन स्वर्णं तत्कालदाहजित् । भृङ्गयोगाच्च तद्वृष्य दुग्धयोगाद् बलप्रदम् ॥
पुनर्नवायुतं नेत्र्यं घृतं योगे रसायनम् । स्मृत्यादिकृद्वचायोगात् कान्तिकृतकुङ्कुमेन च ॥
पयसा राजयक्ष्मघ्नं निर्विष्या च विषं हरेत् । शुण्ठीलवङ्गमरिचैस्त्रिदोषोन्मादनाशकृत् ॥
(Rasajalanidhi 4)

| Swarṇa bhasma when consumed with... | Special benefits |
|---|---|
| Matsya pitta | Instantly reduces dāha (burning sensation) |
| Bhṛṅgarāja swarasa | Vṛṣya (aphrodisiac) |
| Milk | Balaprada (adds to physical strength) |
| Punarnavā kwātha | Netrya (good for eyes) |
| Ghee | Rasāyana (rejuvenator) |
| Vacā cūrṇa | Smṛtivardhaka (enhances memory) |
| Kuṅkuma keśara | Kāntivardhaka (improves radiance) |
| Milk | Cures 'rājayakṣma' and nullifies the effect of 'viṣa' |
| Śuṇṭhī, lavaṅga and marica cūrṇa | Mitigates tridoṣa and cures unmāda roga |

**Swarṇa bhasma sevana- apathya:**

विना विल्वफलं चात्र सर्वमन्यत् प्रशस्यते । (R. Cū. 14/25)

Consumption of 'bilva phala majjā' is the only apathya during administration of 'swarṇa bhasma'.

**Swarṇa bhasma- properties:**

मृतं सुवर्णं मधुरञ्च वृष्यं हृद्यञ्च नेत्र्यं परमञ्च मेध्यम् ।
रसायनं पुंसवनोपयोगि विषापहं कान्तिकरञ्च शस्तम् ॥ (R. T. 15/69)

The properly prepared 'swarṇa bhasma' possesses madhura rasa. Its judicious use for internal administration will improve the virility (vṛṣya). It is good for eyes and heart. It is one among the best intellect promoter (medya) and rejuvenator (rasāyana). It is useful in 'puṁsavana saṁskāra'. It nullifies the ill effects of many poisons on the body and improves the body radiance.

**Swarṇa bhasma- properties:**

स्वर्णं स्निग्धं मधुरमधुरं वृष्यमायुस्यमग्र्यं वर्ण्यं वल्यं विषमज्वरहरं त्वन्त्रशोपक्षयघ्नम् ।
रुच्यं पुण्यं पवनशमनं दीपनञ्चातिकेश्यं हन्यादेतन्नियतमचिरादेव रोगानशेषान् ॥ (R. T. 15/70)

Swarṇa bhasma possesses 'snigdha' guṇa and 'madhura' rasa. When used judiciously for internal administration, it acts as aphrodisiac and improves the quality of life (āyuṣya). It provides good body radiance and physical strength.

It is useful in viṣama jwara and āntra-kṣaya. It improves the taste and is considered auspicious. It mitigates vitiated vāta doṣa and improves the appetite. It nourishes the hair roots, rejuvenates and improves the body strength and cures many more diseases with different adjuvant.

### Śwarṇa bhasma- special properties: (R. T. 15/71-80)

Swarṇa bhasma possesses śīta vīrya. When used judiciously for internal administration, it improves the quality of life by imparting rejuvenation effect. It improves the memory power and cures tridoṣaja jwara. Golden ornaments worn will add to the charm of the person. Especially women use ornaments of this metal to look pretty.

Swarṇa bhasma possesses snigdha guṇa and cures difficulties of speech. It cures the depression, hysteria and such other diseases resulting from cintā, śoka, bhaya and krodha. It improves the blood circulation to the brain and helps in fulfilling the strong desires of the person.

It prevents old age changes occurring in the bones. It prevents the inflammation and pain in the bones. It cures chronic syphilis and scrotal enlargement. It is beneficial in unmāda, restless mind and vyoṣāpasmāra. It also pacifies disturbed mindset, bhrama (giddiness) and glāni (tiredness).

It is beneficial in palpitation, muṣka-śotha, asthi-kṣaya, mūrcchā. kāsa and śwāsa roga. This medicine is the best 'ojovardhaka'. It is also beneficial in atisāra, grahaṇī roga and pāṇḍu roga when used in the form of different formulations.

The judicious use of 'swarṇa bhasma' mitigates the vitiated vāta doṣa, which makes the nerve hyperactive causing neurological diseases. The mitigated vāta doṣa attains samāvasthā and in turn performs its normal function. This bhasma is very beneficial in both children and adults suffering with low intellect, low memory power and low in confidence.

### Śuddha swarṇa- practical usage:

> विशोधितं सुवर्णन्तु रसतन्त्रविचक्षणः । घृष्ट्वा च मण्डलीकृत्य तत्र तत्र प्रयोजयेत् ।।

(R. T. 15/27)

The properly purified gold may be used in the following ways;

1. By rubbing on to the 'rubbing stone' as ghṛṣṭa swarṇa.
2. By preparing thin foils (maṇḍala; 'vark').
3. In the form of swarṇa lavaṇa.

### Ghṛṣṭa śuddha swarṇa- properties:

> विशुद्धं कनकं घृष्टं विषबोधविनाशनम् । मधुरं शीतलं नेत्र्यं गर्भस्थापनमुत्तमम् ।।
> पित्तामयप्रशमनं हृद्दौर्बल्यहरं परम् । अन्यभेषजसाहाय्यात् करोति विविधान् गुणान् ।।

(R. T. 15/28-29)

If the purified gold is rubbed on a 'rubbing stone' and used for therapeutic administration, it alleviates the effects of any poison over the body. This swarṇa possesses 'madhura rasa' and 'śītavīrya'. It is good for eyes and improves the strength of uterine muscles. It mitigates vitiated pitta doṣa and cures dāha, tṛṣṇā and other such symptoms of pittaja roga.

Its judicious use effectively alleviates the weakness of heart. This form of gold (rubbed gold) may be used in many compound formulations that are beneficial in curing many more of ailments.

**Swarṇamaṇḍala (gold foils)- synonyms:**

सुवर्णमण्डलं स्वर्णमण्डलं स्वर्णपत्रकम् । सुवर्णपटलं स्वर्णदञ्चापि प्रकीर्तितम् ।।

(R. T. 15/30)

Suvarṇa maṇḍala, swarṇa maṇḍala, swarṇa patraka, suvarṇa paṭala and swarṇadala; all these are the synonymous words used in the classics for swarṇa maṇḍala (thin foils of gold).

**Swarṇamaṇḍala- properties:**

स्वर्णमण्डलमायुष्यं वह्निमान्द्यविनाशनम् । आक्षेपशमनं नैत्र्यं वीर्यवृद्धिकरं परम् ।।
अम्लपित्तापहं हृद्यं विपाके स्वादु शीतलम् । हिक्कानाहविषश्लेष्मक्षयशूलव्रणापहम् ।।

(R. T. 15/31-32)

The thin foils of purified gold when judiciously used for internal administration through suitable compound formulations, it improves the quality of life. It improves the appetite and alleviates convulsions (ākśepa). It is good to eyes and is the best aphrodisiac. It cures amlapitta roga and is good in curing cardiac ailments.

It possesses 'madhura' vipāka and 'śīta' guṇa. It cures hikkā roga, ānāha and influences of poisons over body. It corrects depleted kapha doṣa, corrects vātaja śūla and cures chronic wounds.

**Suvarṇa paṭala prayoga:**

सुवर्णपटलं सम्यक् सितया परिपेषितम् । तत्तद्रोगघ्नभैषज्ययुतं तत्तद्गदापहम् ।।

(R. T. 15/33)

The very thin foils of purified gold (swarṇa paṭala) are smeared with sugar solution and used for internal administration in different disease conditions concurrently with compound formulations of those particular diseases. By doing so, the diseases will be cured more effectively.

## SWARṆA LAVAṆA (Gold chloride)

**Swarṇa lavaṇa- synonyms:** (R. T. 15/34)

Suvarṇa lavaṇa, swarṇa lavaṇa and hiraṇya lavaṇa; these are the synonyms given to 'gold chloride' in classics.

**Swarṇa lavaṇa- method of preparation:** (R. T. 15/35-38)

The powder of 'śuddha swarṇa' is taken in a clean glass beaker of suitable size. The beaker is firmly placed over a tripod stand and subjected to constant and mild heat with burning 'spirit lamp' placed beneath the stand.

Soon the vessel is added little by little with the mixture of 'lavaṇāmla' (hydrochloric acid) and 'sorakāmla' (nitric acid) in '4:1' ratio. By addition of this acid mixture, the gold in the beaker dissolves. After the gold is completely dissolved, the vessel is added with 10 parts of saindhava lavaṇa in powder form and heated until the entire liquid portion is lost.

The 'nāraṅgī' coloured (reddish yellow) powder in the beaker is later collected and stored in suitable airtight container as 'swarṇa lavaṇa' (gold chloride). As per the need, this gold chloride may be judiciously used after mixing with water for therapeutic purposes.

**Swarṇa lavaṇa- properties:**

सुवर्णलवणं वृष्यं दोषत्रितयकोपजित् । तुवरं स्वादु तिक्तञ्च सलिले च द्रवीभवेत् ॥
पुष्पावरोधं मधुमेहवाधां चिरन्तनञ्चापि फिरङ्गरोगम् ।
अपस्मृतिं श्वासमथोग्रवेगं क्लैब्यं तथोन्मादमलं निहन्यात् ॥ (R. T. 15/39-40)

Suvarṇa lavaṇa (gold chloride) is a good aphrodisiac when judiciously used for internal administration. It mitigates all the three vitiated doṣas. It possesses madhura, tikta rasa and readily dissoles in water.

It corrects the menstrual disorders, cures diabetes and chronic syphilis. It is also beneficial in apasmāra roga (epilepsy), severe śwāsa roga (dyspnoea), klaibya (impotency) and unmāda (psychosis).

**Swarṇa lavaṇa- dosage:**

खशरांशाद्रक्तिकाया विंशांशप्रमितं शुभम् । युञ्जीत स्वर्णलवणं बलकालाद्यपेक्षया ॥
(R. T. 15/41)

From 1/50 rattī (2.5 mgs) to 1/20th rattī (6.25 mgs) is the general dosage of 'swarṇa lavaṇa' (gold chloride). However, the dosage has to be finalized after considering all the relevant factors that affect the dosage.

**Swarṇa lavaṇa- method of administration:** (R. T. 15/42-44)

One rattī (125 mgs) of 'gold chloride' is diluted in 2.5 tola (30 ml) of distilled water and stored in airtight container. Now in suitable disease conditions, 12 drops of this liquid is added with any of the suitable liquid dosage forms (āsava, ariṣṭa, kwātha etc) and administered internally.

Gold chloride should not be used along with rasaouṣadhis. Because, the use of 'swarṇa bhasma' as 'rasouṣadhi' is always good to reap better therapeutic benefits.

**Swarṇa bhasma- few compound formulations:**

1. Swarṇa parpaṭī
2. Hemagarbha poṭṭalī rasa
3. Kastūrībhairava rasa
4. Yogendra rasa
5. Śwāsakāsacintāmaṇi rasa
6. Kṣayakesarī rasa
7. Trailokyacintāmaṇi rasa
8. Makaradhwaja rasa

## 2. RAJATA

(Silver; Ag)

**Rajata- introduction:**

Rajata (silver) is the second 'śuddha loha'. **Silver** is a metallic chemical element with the chemical symbol **Ag** (Latin: argentinum) and atomic number 47. It is a soft, white, lustrous transition metal, it has the highest electrical conductivity of any element and the highest thermal conductivity of any metal. Its capacity to reflect 95% of the light rays makes it the most lustrous metal.

**Medical uses of silver:**

Silver ions and silver compounds show a toxic effect on some bacteria, viruses, algae and fungi, typical for heavy metals like lead or mercury, but without the high toxicity to humans normally associated with these other metals. Its germicidal effects kill many microbial organisms *in vitro*, but testing and standardization of silver products is difficult.

**Occurrence:**

Silver is found in native form, as an alloy with gold (electrum), and in ores containing sulphur, arsenic, antimony or chlorine. Ores include argentite ($Ag_2S$), chlorargyrite ($AgCl$) which includes horn silver, and pyrargyrite ($Ag_3SbS_3$).

The principal sources of silver are the ores of copper, copper-nickel, lead, and lead-zinc obtained from Peru, Bolivia, Mexico, China, Australia, Chile, Poland and Serbia. Peru, Bolivia and Mexico have been mining silver since 1546, and are still major world producers.

Top silver-producing mines are Cannington (Australia), Fresnillo (Mexico), San Cristobal (Bolivia), Antamina (Peru), Rudna (Poland) and Penasquito (Mexico). In India it is mined in Rajasthan and is obtained in smaller quantities in the gold mines of Kolar and Hatti in Karnataka.

**Human exposure:**

Silver itself is not toxic, but most silver salts are, and some may be carcinogenic. Silver and compounds containing it (such as colloidal silver) can be absorbed into the circulatory system and become deposited in various body tissues, leading to 'argyria', which results in a blue-greyish pigmentation of the skin, eyes and mucous membranes.

**Use in food:**

Silver is used in food colouring; it has been approved in the European Union. The amount of silver in the coating of cookie decoration is minuscule. The safety of silver for use in food is disputed. Traditional Indian dishes sometimes include the use of decorative silver foil known as '*vark*' and in various cultures, silver foils are used to decorate cakes, cookies, and other dessert items. The use of silver as a food additive is not approved in the United States and Australia.

**Chemical & physical properties:**

| | |
|---|---|
| Latin name | Argentinum |
| Symbol | Ag |
| Atomic number | 47 |
| Hardness | 2.5 to 3 |
| Specific gravity | 10.4 |
| Lustre | Reflect 95% of the light rays make it the most lustrous metal |
| Malleability | Most malleable and ductile of all the metals |
| Conductivity | Highest conductor of heat and electricity of all metals |
| Melting point | 961°C |
| Boiling point | 2193°C |
| Dilution | Dilutes in 'nitric acid' (to form silver nitrate) and 'aquaregia' (nitro-hydrochloric acid) |

**Rajata (Silver; Ag)- synonyms:**

रजतं रुचिरं रौप्यं तारं सौधञ्च शुभ्रकम् । चन्द्रलोहं चन्द्रहासं रूपकं चन्द्रसंज्ञकम् ।।(R. T. 16/1)

Rajata, rucira, roupya, tāra, soudha, śubhraka, candraloha, candrahāsa, rūpaka and all the words with which the 'moon' is identified in Indian literature are the synonyms of the metal 'silver'.

**Rajata- brief history:**

Silver has a long history. Its references (as coin, utensil and ornament) can be readily traced from literatures like Veda, Upaniṣad and Purāṇa. Its use as medicine is seen in the field of Āyurveda since the beginning.

In many places of 'Caraka Saṁhitā' and 'Suśruta Saṁhitā', we find the references of 'rajata'. With the evolution of 'Rasaśāstra', the metal was extensively studied, described and used for its therapeutic values.

**RAJATA- TYPES**

Depending on the source, it has been divided into two types;

1. Mukta rajata (Native silver)
2. Khanija or Yougika rajata

In free form (native silver); it is available along with lead, zinc and copper. However, it is prominently mined from its ores. The primary ores are;

- Agrentite ($Ag_2S$) with 87.1% of silver.
- Polybasite ($Ag_{16}Sb_2S_{11}$) with 75.6% of silver.
- Cerargyrite ($AgCl$) with 75.1% of silver.
- Proustite ($Ag_3AsS_3$) with 65.4% of silver.
- Pyrargyrite ($Ag_3SbS_3$) with 59.9% of silver.

**Three types:**

सहजं खनिजसञ्जातं कृत्रिमं त्रिविधं मतम् । रजतं पूर्वपूर्वं हि स्वगुणैरुत्तरोत्तरम् ।।

(R. R. S. 5/22)

| | Silver types | Form | Quality |
|---|---|---|---|
| 1 | Sahaja rajata | Native or free silver | Śreṣṭhatama (Best) |
| 2 | Khanija rajata | Silver extracted from ores | Śreṣṭhatara (Better) |
| 3 | Kṛtrima rajata | Silver prepared artificially | Śreṣṭha (Good) |

**Rajata- grāhya swarūpa:**

निर्मलं पिच्छिलं स्निग्धं मृदुलं निर्दलं घनम् । शरदिन्दुनिभं यच्च रजतं जात्यमुच्यते ।।

(R. T. 16/4)

The silver, which is clean, picchila (shiny), snigdha (smooth), mṛdu (soft), nirdala (with no layers) and ghana (heavy); and which appears like the bright full moon; is the best sample of 'silver'.

- Another reference:

छेदे निकाषफलके दहने प्रकामं रम्यञ्च शारदकलाधरमण्डलाभं ।
नाराचिकाधृतमलं गुरुतामुपेयात् स्निग्धं तदेव कथितं रजतन्तु जात्यम् ।। (R. T. 16/2)

The silver when cut with a sharp instrument, rubbed on a rough surface or burnt over fire, it appears very clean and bright as that of 'full moon' (śaratkāla candra). The sample, which is heavy and has shiny and soft exterior surface is considered as the best sample of 'silver'.

**Rajata- agrāhya swarūpa:**

दाहेऽतिमलिनं पीतं रक्तं रूक्षं लघु स्फुटम् । कठिनं सदलञ्चैव रजतं त्याज्यमुच्यते ।।
(R. T. 16/3)

The sample of silver, which looks dirty when heated on fire, which possesses yellowish or reddish shades, which has rough surface and light weight; which is brittle or very hard; and which comes with layers; such a sample is unfit for therapeutic use and it should be rejected.

**Rajata śodhana- necessity:**

तारं विवर्द्धयति सर्गजगात्रतापं वीर्यं विनाशयति हन्ति शरीरपुष्टिम् ।
विड्बन्धनं रचयतीह तथाङ्गसादं ईषन्मृतं त्वपि मृतं यदि शुद्धिहीनम् ।। (R. T. 16/5)

Administration of 'aśuddha rajata' or 'asamyak śuddha rajata' in any form will increase the body temperature abnormally. It depletes the physical strength and virility. It may cause severe constipation, body ache or general debility. Therefore, proper purification of 'rajata' is most necessary before using it for pharmaceutical or therapeutic purposes.

**Rajata- sāmānya śodhana:**

तैले तक्रे गवां मूत्रे ह्यारनाले कुलत्थजे । क्रमान्निषेचयेत्तप्तं द्रावे द्रावे तु सप्तधा ।।
स्वर्णादिलोहपत्राणां शुद्धिरेषा प्रशस्यते ।। (R. R. S. 5/13)

The thin sheets (kaṇṭakavedhi patra) of 'silver' are heated red-hot over fire and dipped into the following liquids; 1. Tilataila 2. Takra 3. Gomūtra 4. Āranāla and 5. Kulattha kwātha for 7 times; in total for one drug it will be 35 times of heating and dipping. This process will purify all the metals in general, that is why it is called as 'dhātu sāmānya śodhana' method.

## RAJATA VIŚEṢA ŚODHANA

**Rajata śodhana- 1st method:**

पत्रीकृतं तु रजतं ज्वलने प्रतप्तं निर्वापयेन्मुनितरोः स्वरसे त्रिवारम् ।
इत्थं विशुद्धममलं खलु चन्द्रलोहं संयोजयेन्मृतिविधौ भिषजां वरेण्यः ।। (R. T. 16/6)

The thin foils of 'silver' are heated red-hot and dipped in 'agastya patra swarasa'. This process of heating and dipping is repeated for 3 times to obtain 'śuddha rajata'. The silver purified with this method can be readily used for the purpose of incineration.

**Rajata śodhana- 2nd method:**

पत्तलीकृतपत्राणि राजतानि भिषग्वरः । वह्नौ प्रतापयेत्कामं वङ्कनालप्रदीपिते ।।
ततो निम्बूकजद्रावे चाङ्गेरीस्वरसेऽपि वा । स्नपयेत्तप्ततप्तानि भूयो भूयः प्रयत्नतः ।।
यावद्राजतपत्राणि मार्दवं यान्ति निर्भरम् । वीतशङ्कस्ततो वैद्यो मारणाय प्रयोजयेत् ।।

(R. T. 16/10-12)

The thin foils of 'silver' are heated red-hot over glowing charcoal connected to a blower (vaṅkanāla) and dipped in 'nimbū swarasa'. This process of heating and dipping is repeated more than once until the foils become smooth. The silver purified with this method can be readily used for the purpose of incineration.

**Rajata śodhana- 3rd method:**

प्रदीप्य वह्निं खलु चुल्लिकायां तस्याम् कटाहञ्च ततो निदध्यात् ।
तदन्तरे चाथ वनोपलोत्थभूत्यालवालं परितो विदध्यात् ।।
अथालवालस्य तु मध्यदेशे रौप्यं क्षिपेद्वै भिषजां वरेण्यः ।
तारोन्मितं शोधितसीसकञ्च निक्षिप्य दर्व्या परिचालयेच्च ।।
द्रुतन्तु तारं त्वथ सीसकञ्च विलोक्य टङ्कं प्रददीत कामम् ।
सीसं मृतं धूमविवर्जितञ्च समाहरेद्रौप्यमलं विशुद्धम् ।। (R. T. 16/7-9)

In a strong open iron vessel (kaḍhāhī) placed over fire, the ash of dry cow dung is filled. The ash is carefully reshuffled to make a pit in the middle with firmly amassed ash on all sides. In that pit, thin foils of 'aśuddha rajata' along with equal quantity of 'śuddha nāga' are placed.

The heating process is continued with frequent stirring. When both the drugs melt completely, the molten metal liquid is added little by little with fine powder of 'śuddha ṭaṅkaṇa'. By doing so, all the 'nāga' present in the mixture is burnt and will be lost in the form of fumes. When all the fumes of 'nāga' subside, the rajata present at the base of the vessel is collected and used as 'śuddha rajata'.

## RAJATA MĀRAṆA

**Rajata māraṇa- 1st method:**

माक्षिकचूर्ण लुङ्गाम्लमर्दितं पुटितं शनैः । त्रिंशद्वारेण तत्तारं भस्मसाज्जायतेतराम् ।। (R. R. S. 5/36)

Required quantity of 'śuddha swarṇa mākṣika bhasma' is triturated with 'nimbū swarasa'. The paste obtained is applied over the foils of 'śuddha rajata'. These foils are dried, enclosed in 'śarāva sampuṭa' and subjected for one 'laghu puṭa'.

All this process is repeated thirty times to subject the drug for 30 puṭa. With final puṭa, appropriately prepared, black coloured 'rajata bhasma' is obtained. It has to be stored in suitable airtight container as 'rajata bhasma'.

**Rajata māraṇa- 2nd method:**

पत्तलीकृतपत्राणि राजतानि समाहरेत् । कर्तर्या कर्तयित्वा च कणान् सूक्ष्मांस्तु कारयेत् ।।
तारपत्रसमं सूतं गन्धञ्च विमलं हरेत् । कुमारीस्वरसं दत्त्वा सम्यक् सम्पेषयेद् बुधः ।।
शरावसम्पुटे न्यस्य करीषाग्नौ पुटेद्भिषक् । एवं स्वल्पपुटैरेव रौप्यं याति हि पञ्चताम् ।।

(R. T. 16/26-28)

The thin foils of 'śuddha rajata' are cut into smaller pieces with a scissor. The pieces are taken in a clean khalva yantra and added with equal quantities of 'śuddha pārada' and 'śuddha gandhaka'. The mixture is triturated thoroughly with 'ghṛtakumārī swarasa' and enclosed in 'śarāva sampuṭa'.

The sampuṭa is later subjected for one 'laghu puṭa'. Like this few puṭas will yield appropriate 'rajata bhasma' which can be used for internal administration without any inhibitions.

**Rajata māraṇa- 3rd method:** (R. T. 16/17-21)

Two karṣa (24 gms) of 'śuddha rajata' is taken along with same quantity of 'śuddha pārada' in a clean khalva yantra and triturated to obtain an amalgam of the same. This amalgam is subjected for thorough trituration with 'nimbū swarasa' for a day. Later it is washed with warm water to remove the sourness.

Later the amalgam is added with two karṣa (24 gms) of 'śuddha gandhaka' and one karṣa (12 gms) of 'śuddha haratāla'. The mixture is triturated thoroughly to obtain it in powder form. The fine powder obtained is now enclosed in 'śarāva sampuṭa' and subjected for one 'laghupuṭa'.

Like this application of 3 laghupuṭa will yield appropriate 'rajata bhasma' having the colour of 'rakta kamala'.

Note: For 2nd and 3rd puṭa, the 'śuddha gandhaka' and 'śuddha haratāla' are freshly added in above said quantity.

**Rajata māraṇa- 4th method:** (R. T. 16/22-25)

The thin foils of 'śuddha rajata' are cut into smaller pieces with a scissor. The pieces are taken in a clean khalva yantra and added with equal quantities of 'śuddha haratāla' and 'śuddha gandhaka'. The mixture is triturated and enclosed in 'śarāva sampuṭa'. The sampuṭa is now subjected for one 'kukkuṭa puṭa'.

Like this three puṭa are applied by adding 'śuddha haratāla' and 'śuddha gandhaka' each time to obtain appropriate 'rajata bhasma' having black colour like that of 'kālāñjana'. This bhasma can be used for internal administration without any inhibitions.

**Rajata māraṇa- 5th method:** (R. T. 16/29-32)

Four tola (48 gms) of 'śuddha rajata' are cut into smaller pieces with a scissor. The pieces are taken in a clean khalva yantra, added with two tola (24 gms) of 'swarṇa mākṣika bhasma', and triturated thoroughly with 'arka kṣīra' for 3 hours (1 yāma). Later the mixture is dried under sun to obtain it in the form of powder.

This drug powder is enclosed in 'śarāva sampuṭa', sealed and dried. This sampuṭa is later subjected for one 'laghu puṭa' with dry cow dung cakes. Like this only few puṭa will yield appropriately prepared, black coloured 'rajata bhasma' which can be used for internal administration without any inhibitions.

Note: The 'swarṇa mākṣika bhasma' is added only in first puṭa. For consecutive puṭa, the drug material is triturated with 'arka kṣīra' and subjected for puṭa. The bhasma prepared with this method is more useful in curing 'udara roga' and 'mandāgni' as the bhāvanā dravya used here is 'arka kṣīra'.

**Rajata māraṇa- 6th method:** (R. T. 16/33-36)

One part of 'śuddha rajata' is cut into smaller pieces with a scissor. The pieces are taken in a clean khalva yantra, added with equal quantity of 'śuddha hiṅgula' and 'swarṇa mākṣika bhasma' and triturated. This mixture is now subjected for one bhāvanā with 'nimbū swarasa'.

The fine powder obtained is enclosed in 'śarāva sampuṭa' and subjected for one 'laghu puṭa'. Like this only few puṭa will yield appropriately prepared, black coloured 'rajata bhasma' which can be used for internal administration without any inhibitions.

Note: The 'swarṇa mākṣika bhasma' is added only in first puṭa. For each consecutive 'puṭa', the drug material is added with 'śuddha hiṅgula' and 'swarṇa mākṣika bhasma', triturated with 'nimbū swarasa' and subjected for 'puṭa'.

**Rajata māraṇa- 7th method:** (R. T. 16/37-40)

The rough powder of 'śuddha rajata' is taken in a clean khalva yantra. It is added with double quantity of 'nimbū swarasa' and 'śuddha hiṅgula cūrṇa'. The mixture is triturated to obtain the mixture in dry powder form.

This dry powder is enclosed in 'ūrdhwapātana yantra'. The yantra is subjected for heat by placing it over fire with a wet cloth on the upper pot's inverted base. The heat is applied until all the pārada from 'hiṅgula' evaporates and accumulates at the base of upper pot.

When cool on its own, the pots of 'ūrdhwapātana yantra' are unsealed. The 'pārada' accumulated at the base of upper pot and the 'śuddha rajata' from the lower pot are separately collected.

This method of 'ūrdhwapātana' is repeated more than once until black coloured, lustre free 'rajata bhasma' is obtained at the base of the lower pot. In each attempt, there will be 'pārada' found accumulated at the base of upper pot. The 'rajata bhasma' prepared with this method can be used for therapeutic administration without any inhibitions.

**Rajata māraṇa- 8th method:** (R. T. 16/41-45)

One part of 'śuddha rajata' is taken in a clean khalva yantra. It is added with equal quantity of 'śuddha pārada' and triturated until all the rajata is digested into mercury and a perfect amalgam is formed. To this, one part of 'śuddha gourīpāṣāṇa' is added and triturated. This mixture is dried under sun to obtain it in fine powder form.

This fine powder is enclosed in 'śarāva samputa' and subjected for one 'gajapuṭa'. When cool on its own, the drug material is taken again in khalva yantra, triturated with equal quantity of 'śuddha hiṅgula', enclosed in 'śarāva sampuṭa' and subjected for second 'gajapuṭa'. Like this three 'gajapuṭa' will yield appropriately prepared, black coloured 'rajata bhasma' which can be used for internal administration without any inhibitions.

Note: The 'śuddha gourīpāṣāṇa' is added only in first puṭa. For each consecutive 'puṭa', the drug material is added with 'śuddha hiṅgula' and subjected for next 'puṭa'. Though the added 'śuddha gourīpāṣāṇa' is lost because of the temperature in consecutive 'gajapuṭa', it makes the 'rajata bhasma' more potent. Rajata bhasma prepared with this method is beneficial in many diseases of vāta and kapha doṣa.

**Rajata bhasma- chemical assay:**

The chemical assay of the 'rajata bhasma' prepared by following strict classical procedures reveal the following contents in it;

| | | |
|---|---|---|
| Silver (as Ag) | : | 55.99 % |
| Iron as $Fe_2O_3$ | : | 14.33 % |
| Calcium as Ca | : | 10.76 % |
| Free sulphur | : | 0.675 % |
| Silver chloride | : | 0.47 % |
| Aluminium | : | Trace |
| Acid insoluble ash | : | 19.90 % |
| Total ash value | : | 94.94 % |

**Rajata bhasma- properties:**

रूप्यं विपाकमधुरं तुवराम्लसारं शीतं सरं परमलेखनकं रूप्यम् ।
स्निग्धं च वातकफजिज्जठराग्निदीपि वल्यं परं स्थिरवयस्करणञ्च मेध्यम् ।।
रौप्यं शीतं कषायाम्लं स्निग्धं वातहरं लघु । रसायनविधानेन सर्वरोगापहारकम् ।।

(R. R. S. 5/28-29)

The 'rajata bhasma' possesses kaṣāya' and 'amla' rasa; 'śīta' vīrya; 'madhura vipāka'; and guru, snigdha and sara guṇa. It exhibits lekhana property. It mitigates vitiated vāta and kapha doṣa.

It is a good appetizer. It improves bala (physical strength), delays the process of aging and is the best intellect promoters (medya). It is one among the best rejuvenators and when used judiciously cures all types of diseases.

**Rajata bhasma- properties:**

तारं मृतं सुशिशिरं तुवरञ्च रुच्यं स्निग्धं विपाकमधुरं परमञ्च मेध्यम् ।
वर्ण्यं परं पवनहारि कफप्रणाशित्वम्लं सरं परमलेखनकञ्च वृष्यम् ।।
सुमृतं चन्द्रलोहन्तु वय:स्थापनमुत्तम् । वल्यं परं दाहहरं स्मृतिकान्तिविवर्द्धनम् ।।
तृष्णाशोपप्रशमनं परमञ्च रसायनम् । भ्रमहारि विशेषेण गर्भाशयविशोधनम् ।।
पित्तामयप्रशमनं प्रमेहाद्यामयापहम् । आयुष्यञ्च विशेषेण विष्टब्धाजीर्णनाशनम् ।।
मदात्ययात्ययकरं वह्निमान्द्यप्रणाशनम् । विपघ्नं ज्वरहृच्चैव प्लीहोदरविनाशनम् ।।
क्षयक्षयकरं नाडीशूलापस्मृतिनुत् परम् । हृद्यं खलु विशेषेण जाठरामयनाशनम् ।। (R. T. 16/46-51)

The 'rajata bhasma' possesses 'śīta' guṇa and 'kaṣāya' rasa. It is snigdha with madhura vipāka. It is one among the best intellect promoters (medya). Its judicious internal use will improve the skin complexion. It mitigates vitiated vāta and kapha doṣa. Along with 'kaṣāya rasa', it also possesses 'amla rasa'. It has 'sara' and 'lekhana' guṇa. It is one among the best aphrodisiacs.

Judicious internal use of 'rajata bhasma' slows down the aging process and provides good physical strength. It cures the burning sensation (dāha) in the body due to vitiated 'pitta doṣa'. It improves the memory power and body radiance. It is useful in tṛṣṇā (thirst) and severe śoṣa (emaciation). It is one among the best rejuvenators.

It cures bhrama (giddiness) due to general weakness and does 'garbhāśaya śodhana'. It cures all types of pittaja roga and prameha roga. Its use improves the quality of life by prolonging the healthy life (āyuṣya) and cures 'viṣṭabdhājīrṇa'. It cures the loss of appetite resulted because of 'madātyaya'. It nullifies the ill effect of many poisons over body.

It is capable of curing chronic fevers and associated splenomegaly. It cures 'kṣaya roga', 'nāḍīśūla' and 'apasmāra'. It is cardio tonic (hṛdya) and is useful in all types of abdominal diseases.

**Rajata bhasma- special properties:**

मृतन्तु तारं शमयेन्नितान्तं प्रकोष्ठगं वातमतिप्रवृद्धम् ।
शाखाश्रयं पित्तमलं विवृद्धं जत्रूर्ध्वसंस्थञ्च कफं मलाख्यम् ।।
प्रक्षीणबुद्धिस्मृतिसाहसानां शिरोभ्रमेणातिविमोहितानाम् ।
अध्यापनादौ सुचिरं रतानां यूनां शिशूनाञ्च परं प्रशस्तम् ।। (R. T. 16/52-53)

The 'rajata bhasma' effectively mitigates vitiated vāta doṣa at 'koṣṭha'. It alleviates the accumulated 'pitta doṣa' from rasa-raktādi dhātu and accumulated 'kapha doṣa' from 'jatrūrdhwa bhāga' (neck and above body parts).

It is beneficial in persons with low intellect, memory power and less courage. It cures giddiness and provides mental stability during emotional outbursts. It is required to maintain the mental steadiness in adults and children who do constant reading and writing works.

**Rajata bhasma- dosage:**

रक्तिकायास्तुरीयांशाद्रक्तिकैकमितं परम् । मृतं तारं नियुञ्जीत बलकालाद्यपेक्षया ।। (R. T. 16/54)

Quarter rattī (31 mgs) to one rattī (25 mgs) is the general dose of 'rajata bhasma'. However, the dose has to be finalized after thorough consideration of all the relevant factors that influence the dosage.

**Adjuvant:**

It may be administered along with honey, ghee, butter or any other suitable adjuvant.

## SILVER FOIL

### Silver foil- synonyms:

चन्द्रलोहदलं चैव स्मृतं रजतमण्डलम् । तदेव तारपटलं मतं तारदलञ्च तत् ॥ (R. T. 16/13)

Candraloha dala, rajata maṇḍala, tāra paṭala and the tāra dala; are the synonymous words used for silver foils in classics.

### Silver foil- properties:

चन्द्रलोहदलं शीतं तुवराम्ल सरम् । विपाकमधुरं बल्यं स्निग्धं रुच्यञ्च लेखनम् ॥
शुक्रमेहघ्नमायुष्यं वयःस्थापनमुत्तमम् । वृष्यं मेध्यं विशेषेण वातपित्तप्रणाशनम् ॥

(R. T. 16/14-15)

The silver foil possesses śīta vīrya, kaṣāya and amla rasa and madhura vipāka. It is balya, snigdha, and rucikāraka with lekhana property. It is beneficial in śukrameha. Its judicious use improves the quality of life and is a good medicine for slowing down the aging process. It is a good aphrodisiac and intellect promoter. It mitigates vitiated vāta and pitta doṣa.

### Silver foil- utility:

ताम्बूलवीटिकादौ वा मिष्टान्नेषु विशेषतः । साम्प्रतं विनियुज्यन्ते चन्द्रलोहदलानि तु ॥

(R. T. 16/16)

The thin foils of silver are used now-a-days for wrapping the readymade 'tāmbūla' (pān) and many other packed food items.

Note: In the indicated diseases and for the aphrodisiac or rejuvenation effect, the thin foils of silver are triturated with the medicine in suitable quantity or wrapped around the medicinal pills and administered for better results. To beat the heat, the silver foils are wrapped around the sweet dishes prepared out of āmalakī and administered with suitable adjuvant.

### Silver- compound formulations:

1. Vijaya parpaṭī
2. Kastūrībhairava rasa
3. Trailokyacintāmaṇi rasa
4. Makaradhwaja rasa
5. Grahaṇīkapāṭa rasa
6. Viṣamajwarāntaka louha
7. Jayamaṅgala rasa
8. Navaratnarājamṛgāṅka rasa

## 3. TĀMRA

(Copper; Cu)

### Introduction:

Tāmra (copper) is the third 'śuddha loha'. **Copper** is a chemical element with the symbol **Cu** (Latin: *cuprum*) and atomic number 29. It is a ductile metal with very high thermal and electrical conductivity. Pure copper is soft and malleable; a freshly exposed surface has a reddish-orange color. It is used as a conductor of heat and electricity, a building material, and a constituent of various metal alloys.

Copper is an essential trace element in plants and animals, but not some micro-organisms. The human body contains copper at a level of about 1.4 to 2.1 mg per kg of body mass. Copper is absorbed in the gut, and then transported to the liver bound to albumin. After processing in the liver, copper is distributed to other tissues in a second phase.

Numerous antimicrobial efficacy studies have been conducted in the past 10 years regarding copper's efficacy to destroy a wide range of bacteria, as well as 'influenza A' virus, adenovirus and fungi.

**Ores and occurrence:**

Copper can be found as either native copper or as part of minerals. There are many examples of copper-containing minerals—'chalcopyrite' and 'chalcocite' are copper sulphides; 'azurite' and 'malachite 'are copper carbonates; and 'cuprite' is a copper oxide. Copper is present in the Earth's crust at a concentration of about 50 parts per million (ppm) and is also synthesized in massive stars.

Largest producers of copper are USA (produces 1/7th of word's copper), Canada (produces 1/10th of word's copper), Australia, China, Russia, Peru, Mexico, Chile Zaire, Zambia and neighbouring Bhutan. In India its mines are in Sikkim and Nellore district of Andhra Pradesh.

**Chemical & physical properties:**

| Latin name | Cuprum |
|---|---|
| Symbol | Cu |
| Atomic number | 29 |
| Atomic weight | 63.54 |
| Hardness | 2.5 to 3 |
| Specific gravity | 8.95 |
| Melting point | 1083.4°C |
| Boiling point | 2567°C |
| Malleability | High malleability (can be made in to > 0.05 mm thin sheets) and very high ductility. |
| Conductivity | Good conductor of heat and electricity. |

| Latin name | Cuprum |
|---|---|
| Atmospheric exposure | Copper does not rust, on exposure it turns from reddish-orange to reddish-brown; it develops a peripheral layer called 'patina' that protects it from further corrosion. |
| Dissolution | It remains unaffected by water or 'dilute hydrochloric acid', but dissolves in 'nitric acid'. |

**Tāmra- synonyms:**

ताम्रं शुल्वं रक्तकं म्लेच्छवक्त्रं नेपालीयं त्र्यम्बकं सूर्यलोहम् ।
त्वाष्ट्रं त्वकं सूर्यपर्यायसंज्ञं द्विष्टं द्वयष्टं त्वम्बकं कीर्तितं तत ।।
उदुम्बरञ्चारविन्दं सूर्याङ्गं लोहितायसम् । रविप्रियं भास्करं च ताम्रकं च प्रकीर्तितम् ।।

(R. T. 17/1-2)

Tāmra, śulba, raktaka, mlecchavaktra, nepālīya, tryambaka, sūryaloha, twāṣṭra, arka; all the synonymous words used for 'sun'; such as dwiṣṭa, dwayaṣṭa, ambaka, udumbara, aravinda, sūryāṅga, lohitāyasa, ravipriya, bhāskara and tāmraka; all these words are used as synonyms of 'copper' in classical books.

**Tāmra- brief history:**

Copper has a long history. Its references (as coin, utensil, ornament) can be readily traced from literatures like Veda, Upaniṣad and Purāṇa. Its use as medicine is seen in the field of Āyurveda since the beginning.

In many places of 'Caraka Saṁhitā' we find the references of 'tāmra' and its 'viṣa lakṣaṇa'. With the evolution of 'Rasaśāstra', the metal was extensively studied, described and used for its therapeutic values.

**Tāmra- types:**

म्लेच्छं नेपालकं चेति तयोर्नेपालकं वरम् । नेपालादन्यखन्युत्थं म्लेच्छमित्यभिधियते ।।

(R. R. S. 5/42)

नेपालं म्लेच्छकम् चेति ताम्रं द्विविधमुच्यते । नेपालं जात्यमाख्यातं म्लेच्छकं त्ववरं स्मृतम् ।।

(R. T. 17/7)

Two types of 'tāmra' are mentioned in classics depending on their availability:

|  | Copper types | Obtained from | Quality |
|---|---|---|---|
| 1 | Naipāli or Naipālika tāmra | Nepal | Śreṣṭha and Grāhya (Therapeutically fit) |
| 2 | Mleccha tāmra | Yavana deśa | Kaniṣṭha and Agrāhya (Therapeutically unfit) |

### Naipāla tāmra- swarūpa:

घनघातसहं स्निग्धं कोमलं गुरु लोहितम् । निर्मलं गुणकृच्चैव नेपालं ताम्रमुच्यते ।। (R. T. 17/8)

The 'naipālika tāmra' is malleable and ductile; it is smooth, soft, reddish coloured; and it remains clean even without frequent washing. Such a copper is considered as the 'grāhya' of 'tāmra'.

### Mleccha tāmra- swarūpa:

कृष्णच्छायं सुकठिनं सितञ्चारुणकं तथा । सुधौतमपि कृष्णं स्यान्म्लेच्छकं ताम्रमुच्यते ।।
(R. T. 17/9)

The 'mleccha tāmra' comes with blackish shades on its body, it will be very hard, it exhibits whitish and reddish colour; it turns black within some time even after proper cleaning; such a variety of copper is considered as the 'agrāhya' variety of 'tāmra'.

### Tāmra- grāhya swarūpa:

सुस्निग्धं मृदुलं शोणं घनाघातक्षमं गुरु । निर्विकारं गुणश्रेष्ठं ताम्रं नेपालमुच्यते ।। (R. R. S. 5/44)

The copper which possesses snigdha guṇa; which is smooth and soft to touch; which is reddish in colour; which has malleability and ductility (ghanaghāta kṣamatwa) and which is heavy (guru); is considered as the best variety of copper (naipālī tāmra).

- Another reference:

घनघातसहं सुचिक्कणं विमलञ्चाथ जपासुमप्रभम् ।
मृदु चैव सदाकरोद्भवं रविलोहं खलु कीर्तितं परम् ।। (R. T. 17/3)

The copper which possesses malleability and ductility, which is smooth to touch; which is clean; and which is soft and reddish like that of 'japā puṣpa' (hibiscus rosa); is considered as the best variety of copper.

- Another reference:

स्निग्धं मृदु घनं स्वच्छं जपाकुसुमसप्रभम् । लोहनागादिरहितं जात्यं ताम्रं प्रकीर्तितम् ।। (R. T. 17/4)

The copper, which is smooth, soft, hard, clean and resembles the colour of 'japā kusuma'. The copper, which is free from adulterants like iron (Fe), lead (Pb) etc is considered as the best variety of copper.

### Tāmra- agrāhya swarūpa:

सदलं पाण्डुरञ्चैव कठिनं लघु भङ्गुरम् । समलं त्वरविन्दन्तु वर्जयेद्रसकर्मणि ।। (R. T. 17/5)

The copper, which comes with layers; which has whitish body shade; which is very hard or light weighted or brittle; which has adulterants like iron, lead etc; such a metal should not be selected for pharmaceutical procedures.

- Another reference:

घनघातासहं कृष्णं श्वेतं लोहादिसङ्गतम् । अतिस्तब्धञ्च रूक्षञ्च ताम्रं त्याज्यं निगद्यते ।।

(R. T. 17/6)

The copper which is not malleable or ductile; which comes with blackish or whitish shade on its body; which has adulterants like iron, lead etc; and which is very hard; such a copper should not be selected for pharmaceutical procedures. Another reference with similar opinion is as below;

सितकृष्णारुणच्छायमतिवामि कठोरकम् । क्षालितं च पुनः कृष्णमेतन्म्लेच्छकताम्रकम् ।।

(R. R. S. 5/43)

**Tāmra- aṣṭa doṣa:**

न विषं विषमित्याहुस्ताम्रम्रं तु विषमुच्यते । एको दोषो विषे ताम्रे त्वष्टौदोषाः प्रकीर्तिताः ।।
भ्रमो मूर्च्छा विदाहश्च स्वेदक्लेदनवान्तयः । अरुचिश्चित्तसन्ताप एते दोषाः विषोपमाः ।।

(Āy. Pra. 3/115-117)

The viṣa (poison) is nothing before the 'tāmra viṣa'. Viṣa may produce one type of doṣa but 'tāmra viṣa' produces eight types of doṣas. They are;

1. Bhrama (Giddiness)
2. Mūrcchā (Syncope)
3. Vidāha (Burning sensation)
4. Sweda (Perspiration)
5. Kleda (Excessive sebaceous secretion)
6. Vamana (Vomiting)
7. Aruci (Anorexia)
8. Cittasantāpa (Restlessness)

Therefore, purification of tāmra is most essential before using it for therapeutic purposes.

Note: Sāmānya śodhana of tāmra cannot purify all these above said 8 doṣas. Therefore, the 'tāmra viśeṣa śodhana' methods explained below are to be followed.

## TĀMRA ŚODHANA

### Tāmra- sāmānya śodhana:

तैले तक्रे गवां मूत्रे ह्यारनाले कुलत्थजे । क्रमान्निषेचयेत्तप्तं द्रावे द्रावे तु सप्तधा ।।
स्वर्णादिलोहपत्राणां शुद्धिरेषा प्रशस्यते ।।

(R. R. S. 5/13)

The thin sheets (kaṇṭakavedhi patra) of 'tāmra' are heated red-hot over fire and dipped into the following liquids; 1. Tilataila 2. Takra 3. Gomūtra 4. Āranāla and 5. Kulattha kwātha for 7 times; in total for one drug it will be 35 times of heating and dipping. This process will purify all the metals in general, that is why it is called as 'dhātu sāmānya śodhana' method.

### Tāmra viśeṣa śodhana- 1st method:

ताम्रनिर्मलपत्राणि लिप्त्वा निम्ब्वम्बुसिन्धुना । ध्मात्वा सौवीरकक्षेपाद्विशुद्ध्यत्वष्टवारतः ।।

(R. R. S. 5/50)

The foils of 'aśuddha tāmra' are thickly applied on either side with the paste prepared by triturating required quantities of 'saindhava lavaṇa' and 'nimbū swarasa' together. The foils are now held with 'sandaṁśa yantra', heated red-hot and dipped in a vessel containing enough quantity of 'kāñjī'.

All this process is repeated for 8 times to obtain the tāmra purified. Later it is stored in suitable airtight container as 'śuddha tāmra' for further pharmaceutical use.

Note: Each time fresh 'kāñjī' should be taken for dipping the red-hot copper.

### Tāmra viśeṣa śodhana- 2nd method:

निम्ब्वम्बुपटुलिप्तानि तापितान्यष्टवारकम् । विशुध्यन्त्यर्कपत्राणि निर्गुण्ड्य रसमज्जनात् ।।

(R. R. S. 5/51)

The foils of 'aśuddha tāmra' are thickly applied on either side with the paste prepared by triturating required quantities of 'saindhava lavaṇa' and 'nimbū swarasa' together. The foils are now held with 'sandaṁśa yantra', heated red-hot and dipped in a vessel containing enough quantity of 'nirguṇḍī patra swarasa'.

All this process is repeated for 8 times to obtain the tāmra purified. Later it is stored in suitable airtight container as 'śuddha tāmra' for further pharmaceutical use.

Note: Each time fresh 'nirguḍī patra swarasa' should be taken for dipping the red-hot copper.

### Tāmra viśeṣa śodhana- 3rd method:

नेपालशुल्वस्य दलानि सूक्ष्माण्यादाय सिन्धूत्थसमन्वितानि ।
संस्वेदयेन्मन्दिरवारिपूते तं नुत्तमां शुद्धिमिहोपयाति ।। (R. T. 17/14)

One part of 'tāmra patra' (foils of copper) are taken in a small sized mud pot. It is added with one part of 'saindhava lavaṇa' and the pot is filled up to the brim with 'kāñjī'. Now the pot is placed over fire and the liquid inside is boiled continuously for a day.

Later the copper foils are taken out, washed with warm water, dried and stored as 'śuddha tāmra'. These foils can be readily used for the purpose of incineration.

**Tāmra viśeṣa śodhana- 4th method:**

वस्वंशसिन्धूत्थसमन्वितानि नेपालशुल्बस्य दलानि कामम् ।
गोमूत्रयुक्तानि पचेद् द्वियामं रविप्रियं शुद्ध्यति नात्र शङ्का ।। (R. T. 17/17)

One part of 'tāmra patra' (copper foils) are taken in a small sized mud pot along with 1/8th part of 'saindhava lavaṇa'. The pot is filled with 'cow's urine' up to the brim, placed over fire and boiled continuously for two prahara (6 hours).

Later the copper foils are taken out, washed with water, dried and stored as 'śuddha tāmra'. These foils can be readily used for the purpose of incineration.

**Tāmra viśeṣa śodhana- 5th method:**

क्षाराम्ललिप्तानि तु ताम्रपत्राण्यग्नौ प्रताप्य स्नपयेत्तु तक्रे ।
क्वाथे कुलत्थप्रभवे च ताम्रं प्रयाति शुद्धिं खलु निर्विशेषाम् ।। (R. T. 17/18)

Required quantity of 'trikṣāra' or 'pañcakṣāra' or 'aṣṭakṣāra' is triturated with 'kāñjī' or any other amla dravya to prepare kalka. This kalka is applied over the foils of copper and dried. Later the paste applied foils are carefully held with 'sandaṁśa yantra', heated red-hot and dipped in 'takra' (buttermilk) and in 'kulattha kwātha'.

This process of kalka application, heating and dipping is repeated for 7 times each in above said liquids. After repeating the process for 14 times, the copper foils are washed with warm water, dried and stored as 'śuddha tāmra'. These foils can be readily used for the purpose of incineration.

## TĀMRA MĀRAṆA

**Tāmra māraṇa- 1st method:**

जम्बीररससंपिष्टरसगन्धकलेपितम् । शुल्बपत्रं शरावस्थं त्रिपुटैर्याति पञ्चताम् ।। (R. R. S. 5/53)

One part each of 'śuddha tāmra patra', 'śuddha pārada' and 'śuddha gandhaka' are taken. First, 'śuddha pārada' and 'śuddha gandhaka' are taken in a clean khalva yantra and triturated thoroughly to obtain appropriate 'kajjalī'.

This kajjalī is triturated with required quantity of 'nimbū rasa'; the paste obtained is applied over the purified copper foils and dried under sun. Later these foils are enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'.

Like this 3 gajapuṭa are given by repeating the entire procedure. After 3rd gajapuṭa, we obtain properly prepared 'tāmra bhasma', which will be fit for 'amṛtīkataṇa'.

Note: If all the relevant 'bhasma parīkṣa' are not fulfilled by the bhasma even after 3 gajapuṭa, the number of puṭa may be increased.

**Tāmra māraṇa- 2nd method:**

पादांशसंशोधितपारदेन सुसूक्ष्मपत्राणि रवेर्विमर्द्य । चाङ्गेरिकापत्ररसप्र षष्टतुल्यांशगन्धेन च पेषयेद्वै ।।
विशोष्य घर्मे खलुसम्पुटस्थं पुटेत् त्रिवारं भिषगप्रमत्तः ।
इत्थं मृतं ताम्रकमामयज्ञः प्रयोजयेत्खल्वमृतक्रियायै ।। (R. T. 17/23-24)

1. Śuddha tāmra cūrṇa- 1 part; 2. Śuddha pārada- quarter part; and 3. Śuddha gandhaka- 1 part; all these drugs are taken in specified ratio. First 'śuddha pārada' is taken in a clean khalva yantra, added with 'śuddha tāmra cūrṇa' and triturated until all the copper is digested in mercury.

Later, 'śuddha gandhaka' is added and triturated thoroughly along with required quantity of 'cāṅgerī patra swarasa' to obtain a homogenous mixture. This mixture is dried under hot sun. The dry powder obtained is enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'.

Like this three gajapuṭas are given by adding 'śuddha pārada' and 'śuddha gandhaka' each time and repeating the entire procedure. After 3rd gajapuṭa, we obtain properly prepared 'tāmra bhasma', which will be fit for 'amṛtīkaraṇa'.

Note: If all the relevant 'bhasma parīkṣa' are not fulfilled by the bhasma even after 3 gajapuṭas, the number of puṭa may be increased.

**Tāmra māraṇa- 3rd method:** (R. T. 17/19-22)

One part of 'śuddha tāmra cūrṇa' and one part of 'śuddha hiṅgula' are taken together in a clean khalva yantra and mixed. This mixture is triturated with required quantity of 'nimbū swarasa' to obtain it in homogenous paste form. The paste is later dried under sun and powdered.

This powder is enclosed in 'ūrdhwapātana yantra' and subjected for intense heat for 1 yāma (3 hours). Next morning when cools on its own, the 'ūrdhwapātana yantra' is de-sealed to find 'tāmra' in powder form at the base of lower pot and 'hiṅgulottha pārada' adhered at the inner base of upper pot.

The obtained 'tāmra cūrṇa' is again added with equal quantity of 'hiṅgula', enclosed in 'ūrdhwapātana yantra' and subjected for intense heat of 3 hours. This process is repeated for 3 times.

The 'tāmra cūrṇa' obtained after 3 times 'ūrdhwapātana' is now triturated with equal quantity of 'śuddha gandhaka'. The mixture is enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'. This process of gandhaka addition and application of 'gajapuṭa' is also repeated for 3 times to obtain 'śuddha tāmra bhasma', which will be fit for further pharmaceutical procedure called 'amṛtīkaraṇa'.

Note: Without proper 'amṛtīkaraṇa', the 'tāmra bhasma' cannot be used for internal administration.

**Tāmra māraṇa- 4th method:** (R. T. 17/26-29)

1. Śuddha tāmra patra- 10 pala (500 gms); and 2. Śuddha gandhaka- 20 pala (1 kgs); both these drugs are taken in specified quantities. Both the drugs are triturated homogenously in a clean khalva yantra. The mixture is now enclosed in 'śarāva sampuṭa' of suitable size. This sampuṭa is placed in the middle of the 'vālukā yantra' and subjected for intense heat of 24 hours.

When cool on its own, the drug mixture is taken out, triturated with equal quantity of gandhaka, enclosed again in 'sampuṭa', placed in 'vālukā yantra' and subjected for intense heat of another 24 hours. This process is repeated for 3 times (vālukā yantra puṭa) to obtain properly prepared 'tāmra bhasma', which will be fit for 'amṛtīkataṇa'. The 'tāmra bhasma' prepared with this method is used for the purpose of 'añjana' and for other external uses.

**Somanāthī tāmra bhasma (5th method):**

> शुल्वतुल्येन सूतेन बलिना तत्समेन च । तदर्धांशेन तालेन शिलया च तदर्द्धया ।।
> विधाय कज्जलीं श्लक्ष्णां भिन्नकज्जलसन्निभाम् । यन्त्राध्यायविनिर्दिष्टगर्भयन्त्रोदरान्तरे ।।
> कज्जलीं ताम्रपत्राणि पर्यायेण विनिक्षिपेत् । प्रपचेद्यामपर्यन्तं स्वाङ्गशीतं विचूर्णयेत् ।।

(R. R. S. 5/65-67)

**Ingredients:**

1. Śuddha tāmra patra : 1 part
2. Śuddha pārada : 1 part
3. Śuddha gandhaka : 1 part
4. Śuddha haratāla : Half part
5. Śuddha manaḥśilā : Quarter part

**Method of preparation:**

Śuddha pārada and śuddha gandhaka are taken in a clean khalva yantra and triturated thoroughly to obtain appropriate kajjalī. To this kajjalī, 'śuddha haratāla' and 'śuddha manaḥśilā' are added and thoroughly triturated to obtain a homogenous mixture.

Now a clean mud pot of suitable size is selected (to use as garbha yantra). In it, some amount of kajjalī is put. Over that, one 'śuddha tāmra patra' is placed. Above that, again kajjalī is put to place another copper foil over it. Like this,

dr.keshav-raj

layers of kajjalī and copper foil are put and at the end, all the remaining kajjalī is heaped up to cover all the copper foils.

Now, the pot is closed with a lid, sealed properly and subjected for intense heat of one prahara (3 hours). When self-cool the drug inside the pot is collected, triturated and stored as 'somanāthī tāmra bhasma'.

Note:

- Since this method was explained by 'Ācārya Somanātha', it is called as 'somanāthī tāmra bhasma'.
- In place of 'śuddha tāmra patra', the 'śuddha tāmra cūrṇa' can also be used.

### TĀMRA BHASMA AMṚITĪKARAṆA

**Tāmra bhasma amṛtīkaraṇa- necessity:** (R. T. 17/34-35)

After preparation of appropriate 'tāmra bhasma' as per classical reference, the bhasma should not be administered without 'amṛtīkaraṇa saṁskāra'. If done so, the bhasma causes eight toxic symptoms in the body, which are called 'tāmra aṣṭa doṣa' (explained earlier in this chapter).

Therefore, the process of 'amṛtīkaraṇa' is most required to any appropriately prepared 'tāmra bhasma'. The definition of 'amṛtīkaraṇa' is provided below, which can also be referred from the chapter 'Paribhāṣā Prakaraṇa';

लोहादीनां मृतानां वै शिष्टदोषापनुत्तये । क्रियते यस्तु संस्कार अमृतीकरणं मतम् ।। (R. T. 2/58)
अरुणभस्मनस्तु पुनरमृतीकरणेन गुणवृद्धिर्वर्णहानिश्च भवति । (Āy. Pra. 1/135)

**Tāmra bhasma amṛtīkaraṇa- 1st method:**

सुमृतं ताम्रचूर्णन्तु तदर्धं गन्धकं तथा । पञ्चामृतेन सम्पेष्य विधानज्ञा भिषग्वरः ।।
शरावसंपुटे न्यस्य ताम्रं विहितचक्रिकम् । त्रिवारं पुटयेदेवं रसतन्त्रविचक्षणः ।।
श्लक्ष्णखल्वेऽथ सम्पेष्य काचकुप्यां तु विन्यसेत् । अमृतीकरणादेवं ताम्रं स्यादमृतोपमम् ।।
(R. T. 17/37-39)

One part of properly prepared 'tāmra bhasma' and half part of 'śuddha gandhaka' are taken in a clean khalva yantra and triturated homogenously. This mixture is added with required quantity of 'pañcāmṛta' (godugdha, godadhi, goghṛta, mākṣika and śarkarā) and triturated thoroughly to prepare 'cakrikās' of even size and shape. These 'cakrikās' are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'.

By repeating this entire procedure thrice and subjecting the drug to 3 'gajapuṭa', we obtain the 'tāmra bhasma', which will be free from all the 'aṣṭa doṣa' (toxicity). Later it is triturated and stored in suitable airtight container for further therapeutic use. After 'amṛtīkaraṇa', the bhasma attains 'amṛta' (nectar) like properties.

Note: The use of 'śuddha gandhaka' for the process of 'amṛtīkaraṇa' is disapproved by many classical texts. Instead, they quote to use only 'pañcāmṛta' (or 'sūraṇakanda swarasa' in some tests). However, the fact is that, the 'śuddha gandhaka' along with 'pañcāmṛta' not only help in making the 'bhasma' toxic free but also provides a kind of synergistic action. As a result, the bhasma attains additional therapeutic properties.

**Tāmra bhasma amṛtīkaraṇa- 2nd method:**

सम्यङ्मृतं सूर्यसखस्य चूर्णं सम्पेषयेद्वै स्वरसे कुमार्याः ।
विशोष्य घर्मेऽथ शरावसंस्थं पचेद् वराहाख्यपुटेऽश्ववारम् ।।
रीत्यानया वै ह्यमृतीकृतन्तु रविप्रियं शीलितमप्यमन्दम् ।
दोषाष्टकं नैव करोति नूनं ताम्रं निकामं त्वमृतोपमं स्यात् ।। (R. T. 17/43-44)

Properly prepared 'tāmra bhasma' is taken in a clean khalva yantra. It is triturated thoroughly with required quantity of 'kumārī swarasa' and later dried under sun. This dry powder is now enclosed in 'śarāva sampuṭa' and subjected for one 'varāhapuṭa'.

By repeating this entire procedure for 7 times and subjecting the drug to 7 'varāhapuṭa', we obtain the 'tāmra bhasma', which will be free from all the 'aṣṭa doṣa' (toxicity). Later it is triturated and stored in suitable airtight container for further therapeutic use.

**Tāmra bhasma amṛtīkaraṇa- 3rd method:**

सम्यङ्मृतं सूर्यसखस्य चूर्णं तदर्धसंशोधितगन्धकञ्च ।
दत्त्वा ततोऽम्लैः खलु निम्बुकोत्थैः सम्पेषयेद् याममलं रसज्ञः ।।
गोलं विधायाऽथ रविप्रियस्य ह्युपर्यधःसूरणकन्दसंस्थम् ।
मृत्कर्पटैश्चाथ विलिप्य गोलं पुटे गजाख्ये पुटयेद्विधिज्ञः ।।
रसागमज्ञैरनया तु रीत्याऽमृतक्रियायां खलु पाचितन्तु ।
वान्त्यादिकं न प्रकरोति नूनं ताम्रं निकामं त्वमृतोपमं स्यात् ।। (R. T. 17/40-42)

One part of properly prepared 'tāmra bhasma' and half part of 'śuddha gandhaka' are taken in a clean khalva yantra and triturated homogenously. This mixture is added with required quantity of 'nimbū swarasa' and triturated thoroughly for one yāma (3 hours) to prepare a bolus. This bolus is dried completely under sun.

The dry bolus is now placed in 'sūraṇa kanda' by carving a burrow in it and closing the opening of the burrow with thick skin part of same 'kanda'. This is now covered with seven layers of wet mud smeared cloth (mṛtvastra lepana) and subjected for one gajapuṭa.

When cool on its own, the 'tāmra bhasma' inside the burnt 'sūraṇa kanda' is collected and triturated. It is later stored in suitable airtight container as 'amṛtīkṛta tāmra bhasma' (or aṣṭa doṣa rahita tāmra bhasma) for further therapeutic use. After 'amṛtīkaraṇa', the bhasma attains 'amṛta' (nectar) like properties.

**Tāmra bhasma- test for perfectness:**

To test the perfectness of 'tāmra bhasma', a pinch of it is taken in a glass jar. It is added with little quantity of curd and left for 24 hours. If the curd exhibits bluish shade, one should understand that the bhasma is not appropriately done.

In such situations, the bhasma is again triturated with 'sūraṇakanda swarasa' and subjected for 'gajapuṭa'. This process may be repeated more than once until the lustre free 'tāmra bhasma' is formed.

**Tāmra bhasma- properties:**

> ताम्रं तिक्तं तुवरमधुरं पाकतश्चोष्णवीर्यं त्वम्लं स्निग्धं खलु विषहरं सारकं लेखनञ्च ।
> पित्तोद्भूतानपि च कफजान् श्लेष्मपित्तोत्थितान् वा घोरान् रोगानपि हि चिरजानप्यशेषांश्च हन्यात् ।।
>
> (R. T. 17/45)

The 'tāmra bhasma' obtained after 'amṛtīkaraṇa' possesses tikta, kaṣāya (tuvara) and madhura rasa; kaṭu vipāka; uṣṇa vīrya; amla rasa; and snigdha guṇa. When judiciously used for internal administration, the 'tāmra bhasma' nullifies the effects of poison over the body.

It possesses 'pitta sāraka' and 'lekhana' properties. It is capable of curing all the acute and chronic diseases of pitta, kapha, or pitta-kapha doṣa predominance.

Note: Some classical references attribute 'śītalatwa' (as guṇa or vīrya) to 'tāmra bhasma', which is contradictory to the properties explained above. In such case, the meaning of 'śītalatwa' should be restricted to the cold touch of the bhasma but not its guṇa or vīrya. Some of the other references with similar meanings are;

> ताम्रं कषायं मधुरं लेखनं शीतलं सरम् । (Rasāmṛta 3/35)
>
> ताम्रं तिक्तकषायकञ्च मधुरं पाके च वीर्योष्णकं साम्लं पित्तकफापहं जठररुक् कुष्ठामजन्त्वन्तकृत् ।
> उर्ध्वाधः परिशोधनं विषहरं स्थौल्यापहं क्षुत्करं दुर्नामक्षयपाण्डुरोगशमनं नेत्र्यं परं लेखनम् ।।
>
> (R. Cū. 14/69)

ताम्रं कषायं मधुरञ्च तिक्तमम्लं च पाके कटु सारकं च ।
पित्तापहं श्लेष्महरं च सोष्णं तद्रोपणं स्याल्लघुलेखनञ्च ॥
पाण्डूदरार्शोगरकुष्ठकासश्वासक्षयान् पीनसमम्लपित्तम् ।
शोफं कृमिं शूलमपाकरोति प्राहुः परे बृंहणमल्पमेतत् ॥ (Āy. Pra. 3/145)

**Tāmra bhasma- special properties:**

मृतन्तु ताम्रं शमयत्यवश्यं शाखाश्रितं कोष्ठसमाश्रितं वा ।
जत्रूर्ध्वगञ्चापि मलाभिघानं पित्तं कफञ्चापि परं प्रवृद्धम् ॥ (R. T. 17/51)

The 'tāmra bhasma' obtained after 'amṛtīkaraṇa' is capable of curing all types of 'śākhāgata' and 'koṣṭhagata' roga. It is also useful in vātaja and kaphaja roga of 'jatūrdhwa bhāga' (neck and the parts above).

**Tāmra bhasma- dosage and adjuvant:**

अष्टमांशाद्रक्तिकाया रक्तिकार्द्धमितं परम् । मृतं ताम्रं प्रयुञ्जीत बलकालाद्यपेक्षया ॥ (R. T. 17/52)

One-eighth of a rattī (15.6 mgs) to half rattī (62.5 mgs) is the general dosage of 'amṛtīkṛta tāmra bhasma'. However, the dosage is finalized after thorough consideration of all the relevant factors that influence the dosage.

Note:

तत्तद्रोगहरानुपानसहितं ताम्रं द्विवल्लोन्मितम् । (R. R. S. 5/68)

In Rasaratnasamuccaya, the dosage of 'amṛtīkṛta tāmra bhasma' is mentioned as 2 valla (6 rattī or 750 mg), which is too high to agree with. Therefore, the reference quoted above (of Rasataraṅgiṇī) should be followed.

Adjuvant: Any suitable adjuvant (swarasa, kwātha, cūrṇa, ghṛta or honey) depending on the disease condition should be used as adjuvant while administration of 'amṛtīkṛta tāmra bhasma'.

**Tāmra bhasma toxicity- measures:**

मुनिव्रीहिं सितापानं धान्यकं वा सितासह । ताम्रदोषमशेषं वै पिबन्हन्याद्दिनत्रयम् ॥
(Bṛ. Rasarājasundara)

In case of any toxicity during administration of 'amṛtīkṛta tāmra bhasma';

- Dhānyaka kwātha + sugar; is administered daily for three days or until the symptoms subside.
- Munivṛīhi cūrṇa + sugar; is administered daily until the symptoms subside.

**Tāmra- compound formulations:**

1. Tāmra parpaṭī
2. Ārogyavardhanī rasa
3. Āmavāteśwara rasa
4. Nityānanda rasa
5. Lakṣmīvilāsa rasa
6. Hṛdayārṇava rasa

7. Kṣayakesarī rasa
8. Tāmreśwara rasa
9. Trivikrama rasa
10. Baḍavānala rasa

## BHŪNĀGA AND MAYŪRAPICCHA SATTVAPĀTANA

Note: As 'tāmra' (copper) is obtained as 'sattva' out of 'Bhūnāga sattvapātana' and 'Mayūrapiccha sattvapātana', those methods as per different references are elaborated below.

### Bhūnāga sattvapātana- 1st method:

ताम्रभूभवभूनागान्निशापिष्टान् समेन तान् । गुडगुग्गुलाक्षोर्णामत्स्यपिण्याकटङ्कणे ।।
दृढमेतैश्च संयोज्य मर्दयित्वा धमेत्सुखम् । मुञ्चति ताम्रवत्सत्त्वं ते पक्षा अपि बर्हिणाम् ।।
(Āy. Pra. 4/52)

The earthworms preferably from the land of copper ores are collected in required quantity. They are washed thoroughly and dried. These dry earthworms are added with equal quantity of 'haridrā cūrṇa' and triturated to obtain a homogenous powder.

This powder is added with guṇa, guggulu, lākṣā, ūrṇa (cotton), matsya (small dry fish), piṇyāka (oil cake after extraction of oil from sesame seeds); (each 1/4th part of bhūnāga) and triturated to obtain a homogenous mixture. This mixture is now enclosed in a suitable crucible and subjected for intense heat to extract copper as the sattva.

Note: The mud contaning exceta of earthworms may also be used here for sattvapātana.

### Bhūnāga sattwapātana- 2nd method:

वर्षर्तौ भूभुजगान् ऊर्णायूद्दीपगुडैः । सौभाग्यालक्तकझषैः पिण्याकक्षोदयुतैः ।।
सम्पेष्य प्राज्ञवरो मूषास्थं वै प्रधमेत् । ताम्राभं सत्त्वमथो मुञ्चति क्षिप्रतरम् ।। (R. T. 17/117-118)

The 'bhūnāga' (bhūbhujaga or earthworms) are collected in enough quantity preferably during rainy season. They are cleaned and dried under hot sun and taken in a khalva yantra.

To this, equal quantities of cotton (ūrṇa), guggulu' (uddīpa), 'jaggery' (guḍa), 'ṭaṅkaṇa' (soubhāgya), 'lākṣā' (alakta), small dry fishes and piṇyāka (oil cake after extraction of oil from sesame seeds); are added and triturated. This mixture is now enclosed in a suitable crucible and subjected for intense heat to extract copper as the sattva.

### Bhūnāga sattwapātana- 3rd method:

धौतभूनागसंभूतं मर्दयेद् भृङ्गजद्रवैः । निम्बूद्रवैश्च निर्गुण्ड्याः स्वरसैस्त्रिदिनं पृथक् ।।

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तद्द्रावणगणोपेतं सम्मर्द्य वटकीकृतम् । निरुध्य दृढमूषायां द्विदण्डं प्रधमेद् दृढम् ॥
स्वतः शीतं समाहृत्य पट्टके विनिवेश्य तत् । खकान् राजिकातुल्यात्रेणूनतिभरान्वितान् ।
द्वादशांशार्कसंयुक्तान्धमित्वा खकान्हरेत् ॥ (R. R. S. 5/220-222)

The earthworms are collected in required quantity. They are washed thoroughly, dried under hot sun and powdered in a clean khalva yantra. This powder is now subjected for 3 days trituration each from 'bhṛṅgarāja swarasa', 'nimbū swarasa' and 'nirguṇḍī swarasa' in successive order.

Later the mixture is added with equal quantity of 'drāvaka gaṇa davya' (guḍa, guggulu, guñjā, ghṛta, madhu and ṭaṅkaṇa) and triturated with required quantity of water to prepare big sized bolus (balls) from the mixture.

These balls are dried under hot sun, enclosed in a suitable crucible and subjected for intense heat of 48 minutes (2 daṇḍa). When self-cool, the drug material is gently triturated to find 'sarṣapa' sized particles, which are tactfully separated.

Now in these 'sarṣapa' sized drug particles, 1/12th part of 'śuddha tāmra' is added. This mixture is again enclosed in a suitable crucible and subjected for intense heat to obtain bigger sized balls of copper as the 'bhūnāga sattva.

**Bhūnāga sattwa- māraṇa:**

भूनागसत्त्वं पलसंमितन्तु रसेश्वरं द्व्यक्षमितञ्च शुद्धम् ।
पलोन्मितं शुद्धसुगन्धचूर्णं दत्त्वा पुटेद् वन्यकरीषवह्नौ ॥
भूनागसत्त्वं पुटितं त्रिधैवं त्वनुत्तमां याति मृतिं निकामम् ।
रसागमाम्भोनिधिकर्णधारः प्रयोजयेत्ताम्रविधानरीत्या ॥ (R. T. 17/119-120)

1. Bhūnāga sattva (śuddha tāmra)- 1 pala (48 gms); 2. Śuddha pārada- 2 akṣa (2 karṣa; 24 gms); 3. Śuddha gandhaka- 1 pala (48 gms); all these drugs are taken in specified ratio.

Śuddha pārada and śuddha gandhaka are taken in a clean khalva yantra and triturated thoroughly to obtain appropriate kajjalī. It is added with specified quantity of 'śuddha tāmra' (bhūnāga sattva) is added and triturated.

This mixture is enclosed in 'śarāva sampuṭa' and subjected for 'gajapuṭa' using dry cow dung cakes. Like this 3 puṭas will yield appropriate bhasma of 'tāmra' obtained as 'bhūnāga sattva'. Its therapeutic utility is same as that of any other 'tāmra bhasma'.

**Bhūnāga sattwa bhasma- properties:**

भूनागसत्त्वं सुमृतं तुवरं कुष्ठनाशनम् । विषघ्नञ्च विशेषेण ताम्रवद् गुणकारकम् ॥ (R. T. 17/121)

Bhūnāga sattva bhasma possesses 'kaṣāya rasa'. Its judicious use like any other 'tāmra bhasma' is helpful in curing 'kuṣṭha roga' (skin diseases). It nullifies the effects of poisonous substances over body. Above all, it possesses all the therapeutic properties of 'tāmra bhasma'.

**Bhūnāga sattwa bhasma- āmayika prayoga:**

भूनागसत्त्वं मतिमान् ताम्रवद्विनियोजयेत् । ताम्रवच्चानुपानानि सहपानानि चादिशेत् ।।
(R. T. 17/122)

The therapeutic utility, dosage and adjuvant of 'bhūnāga sattva bhasma' are same as that of 'tāmra bhasma'. Therefore, its judicious use for internal administration is beneficial in many disease conditions as explained above under the heading 'tāmra bhasma- āmayika prayoga'.

**Bhūnāga sattwa- utility:**

वज्राणां द्रावणार्थाय सत्त्वं भूनागजं । तदेव परमं तेजः सूतराजेन्द्रवज्रयोः ।। (R. R. S. 5/219)

Bhūnāga sattva is useful for 'drāvaṇa' of vajra. It improves the 'teja' or the potency of 'pārada' (mercury) and 'vajra' (diamond).

**Bhūnāga sattwa mudrikā:**

भूनागोद्भवसत्त्वमुत्तममिदं श्रीसोमदेवोदितं, दत्तं पादमितं द्विशाणकनकेनैकं गतेनोर्मिकाम् ।
तद्धौताम्वुविलेपितं स्थिरचरोद्भूतं विषं नेत्ररुक् शूलं मूलगदञ्च कर्णजरुजो हन्यात्प्रसूतिग्रहम् ।।
(R. R. S. 5/231)

One and half māṣa (1.5 gms) of 'bhūnāga sattva' (extracted as per the advice of Śrī Somadeva) is added with six māṣa (6 gms) of 'śuddha māṣa'; these two are melted together to mould them in the form of a ring.

By applying the water obtained after washing this ring, cures all types of jāṅgama and sthāvara viṣa. This water is also useful in netra roga (eye diseases), śūla (different types of pain), arśa (haemorrhoids), karṇa roga (diseases of ear) and in delayed labour.

**Mayūrapiccha sattvapātana- 1st method:**

भूनागसत्त्वमार्गेण सत्त्व मयूरपक्षजम् । निपातयेन्मारयेच्च रसतन्त्रविचक्षणः ।।
भूनागसत्त्ववच्चास्य गुणान् खलु समादिशेत् । आमयेषु च यत्नेन ताम्रवद्विनियोजयेत् ।।
(R. T. 17/123-124)

The 'sattvapātana' (sattva extraction) and the 'māraṇa' (incineration) of mayuūrapiccha (peacock feathers) is same as that of 'bhūnāga sattva pātana' and 'bhūnāga sattva māraṇa'.

Since the sattva obtained here is also 'śuddha tāmra', its therapeutic utility, dosage and adjuvant are same as that of 'tāmra bhasma'. Its judicious use for internal administration is beneficial in many disease conditions as explained above under the heading 'tāmra bhasma- āmayika prayoga'.

### Mayūrapiccha sattvapātana- 2nd method:

> मयूरपक्षमादाय ज्वालेयदाज्यसर्पिषा । गुडगुग्गुलुमीनोर्णा टङ्कणं सञ्जिका मधु ।।
> गुञ्जापिप्पललाक्षा च घृतं चैकत्र कारयेत् । धमेतं दग्धमूषायां नागताम्रं प्रजायते ।।

(Bṛ. R. Rā. Su.)

After removing the mid rib, the feathers of peacock (mayūra piccha) cut into smaller pieces. It is taken in a frying pan along with equal quantity of ghee. The pan is placed over moderate fire and fried until the feathers are completely burnt.

The ash obtained is added with equal quantities of guḍa, guggulu, small dry fish, cotton, ṭaṅkaṇa, sarjakṣāra, madhu, guñjā, pippalī, lākṣā and ghṛta and triturated to prepare a big bolus.

This bolus is enclosed in a suitable crucible (andhamūṣā) and subjected for intense heat (of roughly one hour) to obtain copper (in granular form) at the base of the crucible as 'mayūrapiccha sattva.

### Bhūnāga sattva and mayūrapiccha sattva- significance:

The sattva obtained from both 'bhūnāga' (earthworms) and 'mayūrapiccha' (peacock feathers) is the 'śudha tāmra' (copper). The significance of this copper lies in the fact that, it will be completely free from any adulterant metals like, nāga, vaṅga etc.

The bhasma of these sattvas is equally useful as that of any 'tāmra bhasma'. All the 'āmayika prayoga' explained under 'tāmra bhasma' are applicable here also.

## 4. LOHA

(Iron; Fe)

### Loha- introduction:

Loha (iron) is the third 'śuddha loha'. **Iron** is a chemical element with the symbol Fe (Latin: *ferrum*) and atomic number 26. It is a metal in the first transition series. It is the most common element (by mass) forming the planet Earth as a whole, forming much of Earth's outer and inner core. It is the fourth most common element in the Earth's crust.

Iron chemical compounds, which include ferrous and ferric compounds, have many uses. Iron plays an important role in biology, forming complexes with molecular oxygen in haemoglobin and myoglobin; these two compounds are common oxygen transport proteins in vertebrates. Iron is also the metal used at the active site of many important redox enzymes dealing with cellular respiration, oxidation, and reduction in plants and animals.

**Chemical & physical properties:**

| **Latin name** | **Ferrum** |
|---|---|
| Symbol | Fe |
| Atomic number | 26 |
| Atomic weight | 55.85 |
| Density | 7.874 |
| Melting point | 1535° C |
| Boiling point | 3000° C |
| Conductivity | Relatively poor conductor of heat and electricity |
| Dissolution | Dissolves in water but process takes many months |
| Atmospheric exposure | Reacts with oxygen and form iron oxide ($F_e2O_3$) |
| Chemical response | Turns into iron salts when exposed to acids. Remains unaffected by alkalies. |

**Loha (iron)- brief history:**

Loha has a long history. Its references can be readily traced from literatures like Veda, Upaniṣad and Purāṇa. Its use as sharp instrument (for cutting and slicing the drugs) or as utensil (pātra) or for medicinal (auṣadha) is seen in the field of Āyurveda since the beginning.

In many places of 'Caraka Saṁhitā' and 'Suśruta Saṁhitā', we find the references of 'loha'. By the time of 'Caraka Saṁhitā', the use of 'loha' (ayaskṛti) for medicinal purposes was seen, which became more popular during the period of 'Suśruta Saṁhitā' and 'Aṣṭāṅga Saṅgraha'. With the evolution of 'Rasaśāstra', the metal was extensively studied, described and used for its therapeutic values.

**Loha- types:**

मुण्डं तीक्ष्णं तथा कान्तं लौहं त्रिविधमुच्यते । मुण्डात्तीक्ष्णं ततः कान्तं प्रशस्तं परिकीर्तितम् ।।

(R. T. 20/1)

1. Muṇḍa loha (Cast iron or Pig iron) 2. Tīkṣṇa loha (Wrought iron) and 3. Kānta loha (Magnetic iron); are the three types of 'loha' (iron) available. Among these three types; in comparison with 'muṇḍa loha', 'tīkṣṇa loha'

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possesses more therapeutic properties; and in comparison with 'tīkṣṇa loha', 'kānta loha' is more useful therapeutically.

Note: Both 'tīkṣṇa loha' and 'kānta loha' are used for pharmaceutical as well as therapeutic purposes. The availability of 'kānta loha' is relatively lesser than that of 'tīkṣṇa loha'. Therefore, the pharmaceutical use of 'tīkṣṇa loha' is seen more.

Three types of loha and their subtypes are as shown below in the flow chart;

**(I) Muṇḍa loha (Cast iron):**

| LOHA (IRON)<br>**(Types and Subtypes)** | | |
|---|---|---|
| **(I) MUṆḌA LOHA**<br>(Cast Iron or Pig Iron) | **(II) TĪKṢṆA LOHA**<br>(Wrought Iron) | **(III) KĀNTA LOHA**<br>(Magnetic Iron) |
| 1. Mṛdu-muṇḍa<br>2. Kuṇṭha-muṇḍa<br>3. Kaḍāra-muṇḍa | 1. Khara tīkṣṇa<br>2. Sāra tīkṣṇa<br>3. Hṛnnāla tīkṣṇa<br>4. Tārāvaṭṭa tīkṣṇa<br>5. Vājira tīkṣṇa<br>6. Kālāyasa tīkṣṇa | 1. Bhrāmaka kānta<br>2. Cumbaka kānta<br>3. Karṣaka kānta<br>4. Drāvaka kānta<br>5. Romakānta kānta |

- **Why identified as cast iron?**

  Muṇḍa loha is identified as 'cast iron'. Cast iron is the iron, which contains small amount of carbon (2.5%). It is hard and cannot be bent, so it has to be made into objects by casting. Casting is the process where a molten metal is poured into a container, so that when it hardens it has the required shape.

- **Synonyms:**

  मुण्डं तथा मुण्डलोहं कृपिलोहं शिलात्मजम् । कृष्णायसं दृषत्सारमायसश्च निगद्यते ।। (R. T. 20/2)

  Kṛṣi loha (used to prepare agricultural instruments), śilātmaja (as hard as stone), kṛṣṇāyasa (black coloured), dṛṣatsāra (hardest of all) and āyasa (iron); are the synonymous words for 'muṇḍa loha'.

- **Muṇḍa loha- utility:**

  कटाहपिष्टपचनखल्वादीनां विशेषतः । निर्माणाय मुण्डलोहं साम्प्रतं विनियुज्यते ।। (R. T. 20/5)

  The type of 'iron', which is used for manufacturing 'utensils', 'khalva yantra', 'digging instruments' etc is identified as 'muṇḍa loha'. All these are made through casting.

**Muṇḍa loha subtypes and their lakṣaṇa:** (R. R. S. 5/72-73)

- Mṛdu muṇḍa loha lakṣaṇa: This iron melts easily, it is hard enough to withstand heavy stokes, it is soft, smooth and it possesses considerable malleability (āghāta-vardhanīyatā).

- Kuṇṭha muṇḍa loha lakṣaṇa: This iron has comparatively lesser malleability, in other words expands only little after heavy stroking.
- Kaḍāra muṇḍa loha lakṣaṇa: This iron, is comparatively brittle in its properties and breaks easily when struck; and it exhibits black inner edges when broken.

Note: The above three types of 'muṇḍa loha' are based upon the ability of the iron to withstand the stroking. Because of the impurities present in them, these samples of iron melt at a lower melting point of 1200° C (of genuine iron the melting point is 1535° C).

**(II) Tīkṣṇa loha (Wrought iron):**

- **Why identified as wrought iron?**

  Wrought iron is a type of iron that has good malleability. It can be easily formed into shapes and is used especially for making weapons.

- **Synonyms:**

  लोहो लौहं लोहकञ्च शस्त्रलोहञ्च तीक्ष्णकम् । सारलोहं काललोहं त्वयश्च तदिहोच्यते ।।

  (R. T. 20/3)

  Loha, louha, lohaka, śastra loha (used to prepare sharp weapons), tīkṣṇaka, sāraloha, kālaloha and aya; all these are the synonymous words used in the classics for 'tīkṣṇa loha'.

- **Tīkṣṇa loha- uility:**

  - कृपाणादिविनिर्माणे तीक्ष्णलोहं प्रयुज्यते । (R. T. 20/6)

  The type of 'iron', which is used for manufacturing 'knifes', 'daggers' and other types of 'sharp instruments' is identified as 'tīkṣṇa loha'.

- **Pogara:**

  अङ्गं-छाया च वङ्गञ्च पोगरस्याभिधात्रयम् । चिकुरं भङ्गुरं लोहात्पोगरं तत्परं स्मृतम् ।।

  (R. R. S. 5/80)

In the cut surface (cross section) of an iron sample, the 'aṅga' (appearance), chāyā (shine) and the 'vaṅga' (hairy structures) are the three criteria that are looked for to assesses the quality of iron.

The silky or the hairy structures ('cikur'- sacitra racanā) that are seen in the cut surface (cross section) of an iron sample are called as **'pogara'**. These structures are very brittle, so, 'bhaṅgura' word is also used in the verse.

Note: The word 'vaṅga' indicates the complex hairy structure in the cross section of an iron sample, but not the metal lead.

**Tīkṣṇa loha subtypes and their lakṣaṇa:** (R. R. S. 5/77-82)

- Khara tīkṣṇa loha lakṣaṇa: This iron is hard, lacks 'pogar' but exhibits the lustre of mercury in the cut surface. It reaches the breaking point when bent.
- Sāra tīkṣṇa loha lakṣaṇa: When struck against a harder surface, the edges break in the weapons made of this iron; and exhibit 'pogar' in the cut surface.
- Hṛnnāla tīkṣṇa loha lakṣaṇa: This variety of iron comes with blackish to pale colour, it is very hard and exhibits 'pogar' in the broken surface.
- Tārāvaṭṭa tīkṣṇa loha lakṣaṇa: There is no specific description of this iron variety. Any iron sample that exhibits 'pogar' can be identified as 'tārāvaṭṭa tīkṣṇa loha'.
- Vājira tīkṣṇa loha lakṣaṇa: This iron sample contains very strong and shiny 'pogar' (like diamond) that are very strong but not brittle. It possesses 'śyāma' varṇa (bluish black colour).
- Kālāvasa tīkṣṇa loha lakṣaṇa: This iron sample has 'śyāma' varṇa (bluish black colour), it is dense, soft and shiny, heavy and lustrous. Its edges remain unaffected even with hard stroking.

Note: Out of these six varieties of 'loha', the later one is 100 times better in qualities than the earlier one.

खरलोहात्परं सर्वमेकैकस्माच्छतोत्तरम् । (R. R. S. 5/83)

**(III) Kānta loha (Magnetic iron):**

- **Why identified as magnetic iron?**
  Magnetic iron is a type of iron that acts like magnet (which attracts iron towards it).
- **Synonyms:**
  कान्तलोहं तथा कान्तं त्वयस्कान्तञ्च तन्मतम् । कान्तायसं महालोहं तदेव विनिगद्यते ॥ (R. T. 20/4)

  Kānta loha, kānta, ayaskānta, kāntāyasa and mahā loha; all these are the synonymous words used in the classics for 'kānta loha'.
- **Kānta loha- utility:**
  कान्तलोहञ्च कथितं बुधैः परमदुर्लभम् ॥ (R. T. 20/6)

Though claimed to be therapeutically more potent, this 'kānta loha' is relatively rarer variety of iron.

**Kānta loha subtypes and their lakṣaṇa:** (R. R. S. 5/90-91)

- Bhrāmaka kānta loha lakṣaṇa: The iron, which mobilizes the smaller iron flakes in its vicinity, is identified as 'bhrāmaka kānta lóha'.
- Cumbaka kānta loha lakṣaṇa: The iron, which pulls the smaller iron flakes in its vicinity and holds them over its surface; is identified as 'cumbaka kānta loha'.
- Karṣaka kānta loha lakṣaṇa: The iron, which pulls the smaller iron flakes from a distance and holds them over its surface; is identified as 'karṣaka kānta loha'.
- Drāvaka kānta loha lakṣaṇa: The iron, which pulls or repels the smaller iron flakes from a longer distance; and when melted, it facilitates the melting of these flakes along with it; such a sample of iron is identified as 'drāvaka kānta loha'.
- Romakānta kānta loha lakṣaṇa: The cross section of this iron sample exhibits 'hairy and shiny' structure. Its cut small pieces stand erect on its surface on all sides and appear like hair.

Note: This variety of loha is claimed to be the best variety from therapeutic point of view.

**Tīkṣṇa loha- grāhya lakṣaṇa (Tests of genuineness):**

उज्ज्वलं लोहफलकं धात्रीकाशीसलेपितम् । गिरिश्रृंगांकितं यत्स्यात्तीक्ष्णलोहं तदुत्तमम् ।।

(R. T. 20/8)

- Kalka prepared using 'kāsīsa' and 'āmalakī swarasa' is applied over the surface of 'sample iron sheet'. It is scrubbed and washed. By doing so, if the metal surface becomes bright and lustrous (ujjwala) like mirror, the sample of 'tīkṣṇa loha' is considered genuine.
- By application of above said kalka; if the conical protrusion (giriśṛṅga) are seen over the surface of sample iron sheet, the sample of 'tīkṣṇa loha' is considered genuine.
- Note: The same opinion is expressed in the reference given below;

कासीसामलकल्कास्ते लोहेऽङ्गं दृश्यते स्फुटम् । तीक्ष्णलोहं तदुद्दिष्टं मारणायोत्तमं विदुः ।।
क्षमाभृच्छिखराकाराण्यङ्गान्यम्लेन मर्दिते । लोहे स्युर्यत्र सूक्ष्माणि तत्सारमभिधीयते ।।

(Āy. Pra. 3/214-215)

**Kāntaloha- grāhya lakṣaṇa (Tests of genuineness):**

1. The water boiled in the vessel of 'kānta loha' will have the odour 'hiṅgu'.

2. If a drop of oil is put on the surface of stable water in the vessel of 'kānta loha', the oil drop does not spread.
3. If milk is boiled in the vessel of 'kānta loha', the milk froth rises up in conical shape and does not spill out.
4. If the vessel of 'kānta loha' is applied with the kalka of 'hiṅgu', the odour of 'hiṅgu' will be lost.
5. If the vessel of 'kānta loha' is applied with the kalka of 'nimba', the bitterness of 'nimba' will be lost.

**Loha śodhana- necessity:**

हृदामयं पापरुजञ्च शूलं दाहं गुरुत्वं खलु षण्ढभावम् ।
प्रगाढवित्कत्वमथाश्मरीञ्च त्वशुद्धलोहं जनयत्यवश्यम् ॥ (R. T. 20/10)

Consumption of impure or improperly purified loha in any form will cause hṛdroga (heart diseases), kuṣṭha roga (skin diseases), udaraśūla (abdominal ailments), nāḍīśūla, dāha (burning sensation), gurutā (heaviness in the body), impotency, severe constipation and formation of urinary calculi. Therefore, the 'iron' should be properly purified before any pharmaceutical or therapeutic use.

**Loha sapta doṣa (Saptāyasa doṣa):**

गुरुतादृढतोत्क्लेदः कश्मलं दाहकारिता । अश्मदोषः सदुर्गन्धो दोषाः सप्तायसः स्मृताः ॥
(Āy. Pra. 3/223)

The impure 'iron' if consumed in any form for therapeutic purposes, it causes 1. Gurutā (heaviness in the body) 2. Dṛḍdhatā (body stiffness) 3. Utkleda (nausea) 4. Kaśmala (glāni or tiredness) 5. Dāha (burning sensation) 6. Aśmarī (urinary calculi) and 7. Durgandha (unpleasant body odour).

**Grāhya loha swarūpa for śodhana:**

तीक्ष्णलोहस्य फलकान्यादाय भिषजां वरः । रेतयेल्लोहकारैस्तच्चूर्णं शुद्ध्यै प्रयोजयेत् ॥
(R. T. 20/11)

Some part of 'iron' remains as powder in the blacksmith's workshop when the metal is heated to a high temperature (red-hot) and moulded by hitting hard with heavy hammer. Such 'tīkṣṇa loha cūrṇa' should be taken for the purpose of 'śodhana'.

And,

कृपाणादिविनिर्माणमुख्ययन्त्रालयादितः । सुरेतितं तीक्ष्णलोहचूर्णं शुद्ध्यै नियोजयेत् ॥
(R. T. 20/12)

In the factories where the knives, daggers and other sharp instruments are manufactured, the iron remains as fine powder during the machinery works are carried out on red-hot iron. Such 'tīkṣṇa loha cūrṇa' should be considered for purification.

And,

सूक्ष्मकण्टकवेधीनि पत्राणि खलु कारयेत् । लोहस्य लोहकारैस्तु तानि शुद्ध्यै नियोजयेत् ॥
(R. T. 20/13)

If the iron powder is unavailable either in blacksmith's workshop or from the 'iron goods' manufacturing factories, the prepared thin foils of 'tīkṣṇa loha' should be ordered from the blacksmith or from the factories and used for 'śodhana'.

**Loha śodhana- quantity:**

एकसेटकतस्तीक्ष्णं समारभ्य भिषग्वरः । सेटकत्रयपर्यन्तं शोधयेन्मारयेत्तथा ॥ (R. T. 20/14)

From a minimum of one 'ser' (roughly 1 kg) to a maximum of three ser (roughly 3 kgs) of 'tīkṣṇa loha' should be taken for the purpose of 'loha śodhana'.

Note: From five pala (250 gms) to 13 pala (650 gms) is the minimum and maximum quantity of 'tīkṣṇa loha' advised for the purpose of 'śodhana' in some of the classical books.

Since the efforts taken to purify the metal remain same with whatever quantity taken, lesser than the minimum specified quantity, is not advised. On the other hand, taking more than maximum specified quantity is also not advised, because of the difficulty in carrying out the pharmaceutical procedure. However, depending on the requirement of 'loha bhasma', 'pharmaceutical companies' go for needed quantity of 'loha śodhana'.

## LOHA ŚODHANA

Note: It has been said in the classics that both 'tīkṣṇa loha' and 'kānta loha' can be selected for therapeutic purposes. Since 'kānta loha' is rarely found in enough quantities, 'tīkṣṇa loha' is usually taken for all pharmaceutical procedures.

**Loha sāmānya śodhana:**

तैले तक्रे गवां मूत्रे ह्यारनाले कुलत्थजे । क्रमान्निषेचयेत्तप्तं द्रावे द्रावे तु सप्तधा ॥
स्वर्णादिलोहपत्राणां शुद्धिरेषा प्रशस्यते ॥ (R. R. S. 5/13)

The thin sheets (kaṇṭakavedhi patra) of 'loha' are heated red-hot over fire and dipped into the following liquids; 1. Tilataila 2. Takra 3. Gomūtra 4. Āranāla and 5. Kulattha kwātha for 7 times; in total for one drug it will be 35 times of heating and dipping. This process will purify all the metals in general, that is why it is called as 'dhātu sāmānya śodhana' method.

Another reference quoted below reveals that, all types of 'loha' should be heated red hot and dipped in fresh 'kadalīmūla swarasa' for 7 times to purify them.

तप्तानि सर्वा लौहानि कदलीमूलवारिणि । सप्तधा त्वभिषिक्तानि शुद्धिमायान्त्यनुत्तमाम् ॥

(Rasendrasāra Saṅgraha 1/196)

### Loha viśeṣa śodhana- 1st method:

त्रिफलाऽष्टगुणतोये त्रिफलाषोडशं पलम् ॥
क्वाथ्यं पादावशेषे तु लोहस्य पलपञ्चकम् । कृत्वा पत्राणि तप्तानि सप्तवारं निषेचयेत् ॥

(Rasāmṛta 3/132-133)

Triphalā kwātha preparation for 'loha śodhana': 'Triphalā yavakuṭa cūrṇa' and 'jala' (water) are taken in 1: 8 ratio (ratio quantity given in the verse 16:128) in a clean decoction vessel. The vessel is placed over mild fire, boiled and reduced to quarter (32 parts).

The fine powder of 'tīkṣṇa loha' is taken in a strong bigger sized 'loha darvī' and heated over high flame. When the iron powder becomes red-hot, it is dropped into a vessel containing enough quantity of 'triphalā kwātha'.

The iron powder from the liquid is collected back, heated red-hot again and dropped into the vessel containing fresh 'triphalā kwātha'. This process is repeated for 7 times to obtain the 'śuddha loha'.

### Loha viśeṣa śodhana- 2nd method:

समुद्रलवणोपेतं तप्तं निर्वापितं खलु । त्रिफलाक्वथिते नूनं गिरिदोषमयस्त्यजेत् ॥

(R. R. S. 5/104)

Required quantity of 'saindhava lavaṇa' is triturated with little quantity of water to prepare its paste. This paste is thickly applied over the thin foils of 'loha' and dried. These foils are now held with 'sandaṁśa yantra', heated red-hot and dipped in 'triphalā kwātha'. All this process is repeated for 7 times to obtain the 'śuddha loha'.

### Loha viśeṣa śodhana- 3rd method:

अतिसूक्ष्मरजस्त्वयसा ज्वलने परितप्तमलं मुनिवारमिह ।
कदलीनवमूलजले नियतं विमलत्वमुपैति निपेचनतः ॥

(R. T. 20/17)

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The fine powder of 'tīkṣṇa loha' is taken in a strong bigger sized 'loha darvī' and heated over high flame. When the iron powder becomes red-hot, it is dropped into a vessel containing enough quantity of 'kadalī kanda swarasa'.

The iron powder from the liquid is collected back, heated red-hot again and dropped into the vessel containing fresh 'kadalī kanda swarasa'. All this process is repeated for 7 times (munivāra) to obtain the 'śuddha loha'.

**Loha viśeṣa śodhana- 4th method:**

वराकषायसंयुते समे गवान्तु मूत्रके । निषेचितं तु सप्तधा त्वयो विशुद्धिमाप्नुयात् ।।

(R. T. 20/18)

The fine powder of 'tīkṣṇa loha' is taken in a strong bigger sized 'loha darvī' and heated over high flame. When the iron powder becomes red-hot, it is dropped into a vessel containing enough quantity of 'triphalā kwātha' added with 'gomūtra' in equal ratio.

The iron powder from the liquid is collected back, heated red-hot again and dropped into the vessel containing fresh 'triphalā kwātha' + 'gomūtra' mixture. All this process is repeated for 7 times to obtain the 'śuddha loha'.

## LOHA PĀKA

### Introduction:

In ancient times when 'māraṇa' (incineration) procedures for metals were not in practice, the 'śuddha loha' was subjected to above said three types of pāka. The fine powder obtained after 3rd pāka (puṭa pāka) was used for therapeutic purposes.

Now, when the incineration procedures of metals are rationally developed, these 'trividha loha pāka' have no relevance. Only for the knowledge of students, these methods are elaborated here.

### Trividha loha pāka:

प्रथमं भानुपाकेन स्थालीपाकात्ततः परम् । पुटपाकेन पक्वञ्च लौहं सुमृतिमाप्नुयात् ।।

(R. T. 20/20)

The 'trividha pāka' are;

1. Bhānu-pāka
2. Sthālī-pāka
3. Puṭa-pāka

After purification of 'loha', the 'śuddha loha' has to be subjected to three types of pāka specified above, in order to obtain appropriate 'loha bhasma'.

### Bhānu pāka of 'śuddha loha cūrṇa':

वराक्वाथयुतं लौहं भानोः प्रखरभानुभिः । शुष्यन् विपच्यते यस्माद् भानुपाकस्ततः स्मृतः ॥

(R. T. 20/21)

The 'loha cūrṇa' is taken in a clean suitable vessel (kaḍhāhī) along with enough quantity of 'triphalā kwātha'. The vessel is placed under hot sun to dry up all the liquid. This process is called as 'bhānu-pāka' of 'loha cūrṇa'.

Method: The 'śuddha loha cūrṇa' is washed thoroughly in water. Later it is taken in a suitable vessel (a 'kaḍhāhī') or in wider 'khalva yantra' and added with enough quantity of 'triphalā kwātha'. This vessel is placed under hot sun until all the liquid part evaporates.

Later fresh 'triphalā kwātha' is added in enough quantity and evaporated again under hot sun. This process is repeated for 7 times to complete the 'bhānu-pāka' of 'loha cūrṇa'.

The preparation of 'triphalā kwātha' required for 'loha śodhana' is as follows; one part of roughly powdered 'harītakī' 'bibhītakī' and 'āmalakī' are taken in equal ratio in a clean decoction vessel. It is added with double quantity (2 parts) of 'water', boiled over mild fire and reduced to quarter. It is later filtered and used for the purpose of 'bhānu-pāka'. (R. T. 20/22-24)

### Sthāli-pāka of 'śuddha loha cūrṇa':

त्रिफलाक्वथितोपेतं लौहं स्थाल्यां खराग्निना । शुष्यन् विपच्यते यस्मात् स्थालीपाकस्ततः स्मृतः ॥

(R. T. 20/25)

After proper 'bhānu-pāka', the 'loha cūrṇa' is again taken in a clean suitable vessel (kaḍhāhī) along with enough quantity of 'triphalā kwātha'. This time the vessel is placed over intense fire and heated to evaporate all the liquid. This process is called as 'sthālī-pāka' of 'loha cūrṇa'.

Method: The 'śuddha loha cūrṇa' is washed thoroughly in water. Later it is taken in a suitable vessel (a 'kaḍhāhī') along with enough quantity of 'triphalā kwātha'. This vessel is placed over intense heat and cooked until all the liquid part evaporates.

Later fresh 'triphalā kwātha' is added in enough quantity and cooked again to evaporate the liquid. This process is repeated for seven times to complete the 'sthālī-pāka' of 'loha cūrṇa'.

The preparation of 'triphalā kwātha' required for 'loha śodhana' is as follows; to 1 part of 'loha cūrṇa' three parts of roughly powdered 'harītakī' 'bibhītakī' and 'āmalakī' are taken in equal ratio in a clean decoction vessel. It is added with 16 parts of 'water', boiled over mild fire and reduced to 1/8th part. It is later filtered and used for the purpose of 'sthālī-pāka'.

Liquids used: Other than 'triphalā kwātha', the other liquid that can be used for the purpose of 'sthālī pāka' are; 'śatāvarī swarasa', 'bhṛṅgarāja swarasa', 'hastikarṇa swarasa' and 'palāśa mūla swarasa'.

Other than all these liquids mentioned above, any other 'swarasa' or 'kwātha' felt suitable after considering the disease condition and the doṣa involvement (in which the prepared loha bhasma is administered) can be considered for the purpose of 'sthālī pāka'. (R. T. 20/26-30)

**Puṭa pāka of 'śuddha loha cūrṇa':**

> रसादिभिर्भेषजानां खल्वे लौहं विमर्दितम् । पुटस्थं पच्यते यस्मात् पुटपाकस्ततः स्मृतः ।।
>
> (R. T. 20/31)

The 'loha cūrṇa' obtained after 'sthālī pāka' is taken in a clean khalva yantra. Triturated thoroughly with desired liquid preparation (swarasa, kwātha etc) and dried under hot sun.

This dry powder is enclosed in 'śarāva sampuṭa' and subjected for appropriate 'puṭa' using dry cow dung cakes. All this procedure is called as 'puṭa pāka of loha cūrṇa'.

Method: The 'loha cūrṇa' obtained after 'sthālī pāka' is washed properly with water. Later it is taken in a clean iron khalva yantra, added with suitable liquid preparation (swarasa, kwātha etc) and triturated thoroughly to prepare 'cakrikās' (pellets) of even size and shape.

These pellets are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for 'gajapuṭa' using dry cow dung cakes (either natural or handmade). All of this process is repeated more than once by triturating with different suitable liquids.

Sixty, hundred or thousand number of 'puṭa' are mentioned in classics for loha puṭa pāka. More the number of 'puṭa' better will be the 'bhasma' formed. (R. T. 20/32-38)

**Liquid medicines used and their significance:**

The liquid preparations used in 'loha cūrṇa puṭa pāka' like 'triphalā kwātha'; swarasa or kwātha prepared from 'vidāryādi gaṇa', 'kirātādi gaṇa', 'daśamūla', 'śaṭyādi gaṇa' etc are taken in equal quantity to that of 'loha cūrṇa'.

After triturating with above said liquids, more the number of 'puṭa' given, better will be the quality of bhasma. Loha bhasma prepared by more number of 'puṭa' will not cause constipation and can be used for infinite period of time. (R. T. 20/39-41)

**Loha- suitable for māraṇa:**

समलं मुण्डलोहं तु मारणाय न योजयेत्। तीक्ष्णलोहं कान्तलोहं यथालाभं प्रयोजयेत्।। (R. T. 20/7)

For the purpose of incineration, 'muṇḍa loha' should never be taken as it is adulterated with many other metals (mala). The remaining two varieties 'tīkṣṇa loha' and 'kānta loha' can be considered for the purpose of 'māraṇa'.

Note: As said above, the abundantly available 'tīkṣṇa loha' is selected here in comparison with rare 'kānta loha'.

**Loha māraṇa- 1st method:**

समगन्धमयश्चूर्णं कुमारीवारिभावितम् । पुटीकृतं कियत्कालमवश्यं म्रियते ह्ययः ।। (R. R. S. 5/123)

One part of 'śuddha tīkṣṇa loha cūrṇa' is taken in a clean khalva yantra along with equal quantity of 'śuddha gandhaka cūrṇa' and triturated to get a homogenous mixture. This mixture is added with equal quantity of 'ghṛtakumārī swarasa' and triturated thoroughly to prepare 'cakrikās' (pellets) of even size and shape. They are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'.

All this procedure is repeated more than once to subject the drug for few 'gajapuṭa' (roughly around 8 to 10) to obtain reddish coloured and properly prepared 'loha bhasma'.

**Loha māraṇa- 2nd method:**

अथ पूर्वोदितं तीक्ष्णं वसुभल्लकवासयोः । पुटितं पत्रतोयेन त्रिंशद्वाराणि यत्नतः ।।
शोणितं जायते भस्मं कृतसिन्दूरविभ्रमम् ।। (R. R. S. 5/116)

The 'śuddha tīkṣṇa loha cūrṇa' is taken in a clean khalva yantra. It is subjected to one 'bhāvanā' each with required quantities of 'śweta punarnavā swarasa' and 'vāsā patra swarasa' simultaneously.

Later the 'bhāvita loha cūrṇa' is enclosed in 'śarāva sampuṭa' and subjected for one gajapuṭa. All this process is repeated thirty times to subject the drug for 30 'gajapuṭa'. Finally, after 30th puṭa, we obtain properly prepared, red coloured 'loha bhasma'.

**Loha māraṇa- 3rd method:**

विशोधितं कान्तलोहं धात्रीस्वरसपेषितम् । पुटेद् गजपुटेनैव शतधा कृतचक्रिकम् ।।

शतधा पुटितं कान्तं यात्येवं मृतिमुत्तमाम् । रसायनं परमिदं तथायुष्करमुत्तमम् ।।(R. T. 20/78-79)

The 'śuddha tīkṣṇa loha cūrṇa' is taken in a clean khalva yantra. It is added with equal quantity of 'āmalakī swarasa' and triturated thoroughly to prepare 'cakrikās' (pellets) of even size and shape. They are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'.

Like this 100 'gajapuṭa' are given by repeating all the above process to obtain reddish coloured and properly prepared 'loha bhasma' (like that of rakta kamala). The bhasma prepared with this method can be used for all types of pharmaceutical and therapeutic purposes. It possesses 'rasāyana' (rejuvenation) and 'āyuṣya' (āyu-vardhaka) guṇa.

### Loha māraṇa- 4th method:

विमलं लौहचूर्णन्तु निम्बुकोत्थेन वारिणा । भृशं सम्पेष्य यत्नेन चक्रिकाः कारयेत्ततः ।।
सम्पुटस्थं ततः कृत्वा पुटेद् गजपुटेन तु । पञ्चाशद्भिः पुटैरेवं लौहं सुमृतिमाप्नुयात् ।।
भस्म सञ्जायते चैवं रक्तोत्पलसमप्रभम् । एवं मृतं त्वायसन्तु सर्वत्र विनियोजयेत् ।।
(R. T. 20/61-63)

The 'śuddha tīkṣṇa loha cūrṇa' is taken in a clean khalva yantra. It is added with equal quantity of 'nimbū swarasa' and triturated thoroughly to prepare 'cakrikās' (pellets) of even size and shape. They are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'.

Like this 50 'gajapuṭa' are given by repeating all the above process to obtain reddish coloured and properly prepared 'loha bhasma' (like that of rakta kamala). The bhasma prepared with this method can be used for all types of pharmaceutical and therapeutic purposes.

### Loha māraṇa- 5th method:

गोमूत्रैस्त्रिफलाक्वाथ्या तत्कषायेण भावयेत् । त्रिःसप्ताहं प्रयत्नेन दिनैकं मर्दयेत्पुनः ।।
रुद्ध्वा गजपुटे पच्याद्दिनं क्वाथेन मर्दयेत् । दिवा मर्द्यं पुटेद्रात्रावेकविंशद्दिनावधि ।।
एकविंशत्पुटैरेवं म्रियते त्रिविधं ह्ययः ।। (R. R. S. 5/125-126)

The 'śuddha tīkṣṇa loha cūrṇa' is taken in a clean khalva yantra. It is added required quantity of 'gomūtra triphalā kwātha' (prepared by taking 1 part of 'triphalā yavakuṭa cūrṇa' + 8 parts of 'gomūtra'; boiled, reduced to 1/4th and filtered) and triturated for 21 days.

Later the triturated 'loha cūrṇa' is enclosed in 'śarāva sampuṭa' and subjected for one gajapuṭa. Next day when 'puṭa' is self-cool, the drug inside 'śarāva' is again subjected for one day's trituration with 'gomūtra triphalā kwātha', enclosed in 'śarāva sampuṭa' and subjected for another gajapuṭa.

This process of trituration for a day and subjecting drug for gajapuṭa is repeated for twenty times more. Like this in total 21 'gajapuṭa' we obtain properly prepared 'loha bhasma'. With this method of incineration, all the three types of loha (muṇḍa loha, tīkṣṇa loha and kānta loha) can be incinerated.

**Loha bhasma- comparative superiority:**

किट्टाद्दशगुणं मुण्डं मुण्डात्तीक्ष्णं शतोन्मितम् । तीक्ष्णाल्लक्षगुणं कान्तं भक्षणात्कुरुते गुणान् ।।
(R. R. S. 5/147)

In comparison with 'maṇḍūra bhasma', 'muṇḍa loha bhasma' is 10 times better; in comparison with 'muṇḍa loha bhasma', 'tīkṣṇa loha bhasma' is 100 times better; and in comparison with 'tīkṣṇa loha bhasma', 'kānta loha bhasma' is 'one lakh' (100000) times better in its therapeutic benefits.

**Loha bhasma- colour:**

पक्वजम्बूफलच्छायं कान्तलोहं तदुत्तमम् ।। (R. R. S. 5/140)

The colour of 'pakwa jambū phala' (blackish red) is the appropriate colour of properly prepared 'loha bhasma'.

Note: If the bhasma is obtained in pure red or brick red colour, it is indicative of incinerated drug in 'iron oxide' form. If the bhasma is obtained in more blackish colour, it indicates the insufficient supply of heat to the drug during its incineration process.

**Lohamāraka gaṇa:**

त्रिफला शतमूली च सिंहिका तालमूलिका । नीलोत्पलञ्च ह्रीवेरं दशमूलं पुनर्नवा ।।
वृद्धदारकमूलञ्च भृङ्गं विश्वं विडङ्गकम् । करञ्जशिग्रुनिर्गुण्डीसुरसैरण्डमूलकम् ।।
हस्तिकर्णपलाशश्च पर्पटश्चन्दनं तथा । समाख्यातो गणोऽयन्तु लोहमारकसंज्ञकः ।।
(R. T. 20/42-44)

Triphalā, śatāvarī, vāsā, muśalī, nīlakamala, sugandhabālā, daśamūla, punarnavā, vṛddhadāru mūla, bhṛṅgarāja, śuṇṭhī, viḍaṅga, karañja, śigru, nirguṇḍī, tulasī, eraṇḍamūla, hastikarṇa, palāśa, parpaṭa and candana; all these drugs are together branded as 'lohamāraka gaṇa'.

These drugs used in the process of 'loha māraṇa' (incineration of loha cūrṇa) make the procedure of incineration easier and render more efficacy to the 'loha bhasma' prepared.

**Loha māraka gaṇa- significance:**

तत्तद्रोगघ्नभैषज्यैस्तत्तद्रोगापनुत्तये । यथालाभं पुटेत्कामं प्राणाचार्यो विचक्षणः ।।
पुटितस्यायसोऽभावे तत्तद्रोगघ्नभेषजैः । त्रिफलापुटितं लोहं सर्वत्र विनियोजयेत् ।। (R. T. 20/51-52)

To treat the 'vātaja', 'pittaja' or 'kaphaja roga' with loha bhasma, it is always better to prepare the 'bhasma' using the drugs from 'vātahara lohamāraka gaṇa' (R.T. 20/45-46), 'pittahara lohamāraka gaṇa' (R.T. 20/47-48) and 'kaphahara lohamāraka gaṇa' (R.T. 20/49-50) as 'bhāvanā dravya' before each 'puṭa'.

The general 'lohamāraka gaṇa' mentioned above contains drugs that mitigate all the three doṣas. If none of these drugs are available, it is better to use 'triphalā kwātha' as the universal liquid for the purpose of 'loha māraṇa'. Bhasma prepared by using 'triphalā kwātha' as 'bhāvanā dravya' can be used in any of the disease conditions.

**Loha bhasma- nirutthikaraṇa:**

मृतं लौहं गव्यमाज्यं तथा शुद्धञ्च गन्धकम् । दत्वा कन्याम्भसा पिष्ट्वा शुष्कचूर्णञ्च कारयेत् ।।
सम्पुटेस्थं ततः कृत्वा पुटेद् गजपुटे भृशम् । इत्थमेकपुटेनैव भवेल्लोहं निरुत्थितम् ।।
(R. T. 20/80-81)

The properly prepared 'loha bhasma' (with any of the above explained methods) is taken in a clean khalva yantra. It is added with equal quantities of 'goghṛta' (ghee) and 'śuddha gandhaka' (purified sulphur) and triturated.

This mixture is now subjected for one bhāvanā with 'ghṛtakumārī swarasa'. The dry powder obtained is enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'. Like this, one 'gajapuṭa' will yield 'nirutthita' loha bhasma.

**Loha bhasma nirutthikaraṇa- confirmation:**

विविधविधिहतं वै त्वायसं तीक्ष्णकान्तं घृतमधुपुरगुञ्जाटङ्कणक्षोदयुक्तम् ।
सुपुटितमनलस्थं क्षेत्रयत्यात्मभावं भवति सुमृतमेतत्सर्वयोगोपयुक्तम् ।। (R. T. 20/82)

The properly prepared 'loha bhasma' (with any of the above explained methods) is taken in a clean khalva yantra. It is added with equal quantities of 'mitrapañcaka dravya' (ghṛta, madhu, guggulu, guñjā and śuddha ṭaṅkaṇa cūrṇa), enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'.

After this 'gajapuṭa' if the 'loha bhasma' stays in the same bhasma form, it is considered as 'niruttha bhasma' (sumṛta loha bhasma) and can be used for all types of pharmaceutical and therapeutic purposes.

On the other hand if the bhasma regains 'free metal' (iron) form after above said 'gajapuṭa', then the bhasma is not completely formed or it is considered 'aniruttha bhasma' (amṛta loha bhasma).

Note: In such cases, the 'aniruttha bhasma' can be subjected for further more 'puṭa' as per classical reference to obtain 'niruttha bhasma'.

**Loha bhasma- properties:**

> लौहं रूक्षं सुमधुरमलं पाकतश्चाथ तिक्तं वीर्ये शीतं गुरु च तुवरं लेखनञ्चातिनेत्र्यम् ।
> बल्यं वृष्यं जठरगदनुत् श्लेष्मपित्तामयघ्नं वर्ण्यं मेध्यं खलु किमधिकं हन्ति नानामयघ्नम् ॥
>
> (R. T. 20/83)

Properly prepared 'tīkṣṇa or kānta loha bhasma' possesses rūkṣa, guru and lekhana guṇa; madhura vipāka; tikta, kaṣāya rasa and śīta vīrya. Its judicious internal use is good for eyes and eyesight.

Its use improves the physical strength. It is aphrodisiac. It cures udara roga and kapha-pittaja roga. It provides good body complexion (varṇya) and promotes intellect (medhya). With different adjuvant, this 'loha bhasma' is useful in many number of diseases.

- Another reference:

> लौहं दीपनमुत्तमं क्षयहरं कुष्ठामयध्वंसकं गुल्मप्लीहविधूननं क्रिमिहरं पाण्ड्वामयघ्नं परम् ।
> मेदोमेहनिवर्हणं गदहरं दुर्नामरोगान्तकृत् छर्दिश्वासहरं त्वलं बहुगिरा योगेन नानार्तिनुत् ॥
>
> (R. T. 20/84)

Properly prepared 'loha bhasma' is a good appetizer. It is beneficial in curing kṣaya roga, kuṣṭha roga, gulma roga, plīhā roga, udaraja krimi roga and pāṇḍu roga. It is beneficial in medoroga and prameha roga.

It nullifies the toxic effects of garaviṣa. It cures arśaroga, chardi roga and śwāsa roga. With different adjuvant, this 'loha bhasma' is useful in many number of diseases.

- Another reference:

> विसर्पकरिकेशरी प्रबलशूलनिर्मूलनः क्षयक्षयकरः परं चिरजशोथं सङ्कोचनः ।
> यकृद्गदविघूननो गुदमहागदेभाङ्कुशः परं विजयतेतरां विधिहतस्तु लौहो ह्ययम् ॥ (R. T. 20/85)

Properly prepared 'loha bhasma' is useful in 'visarpa roga', severe 'śūla', kṣaya roga and chronic oedema. It cures the diseases of liver and anus (guda roga).

- Another reference:

> श्वासं नाशयति क्रिमीन् कृशयति क्षैण्यं क्षिणोति द्रुतं शोपं शोपयति भ्रमं त्वपहरेच्छूलं समुन्मूलयेत् ।
> कासं ह्रासयति क्षयं क्षपयति भ्रान्ति निहन्त्यन्ततः स्थौल्यं विह्वलयत्पलं दलयति श्लेष्मामयान् सर्वथा॥
>
> (R. T. 20/86)

Appropriately prepared 'loha bhasma' is useful in śwāsa roga and uadraja krimi roga. It cures the 'kṛśatwa' (leanness because of emaciation), śoṣa roga, bhrama, all types of śūla, kāsa, kṣaya, bhrānti (restlessness), sthoulya and all types of kaphaja roga.

### Loha bhasma- guṇa: (R. T. 20/87-96)

Appropriate 'loha bhasma' is useful in chronic atisāra (dysentry), acute gaṇḍamālā, amenorrhea, vṛkka śotha, hṛdroga, viṣama jwara (intermittent fevers), phiraṅga (syphilis), pāṇḍu roga (anaemia), kāmalā (jaundice), halīmaka, vyoṣāpasmāra, śweta pradara (leucorrhoea), madhumeha (diabetes), māṁsatāna (diphtheria), all types of śoṣa (kṣaya) roga, tāṇḍava roga, sūtaka jwara, stomatitis (galakṣata), āmavāta (rheumatoid arthritis), diseases of liver, bhagandara (fistula), pīnasa (rhinitis) and amlapitta (hyper-acidity).

It prevents the outflow of blood from ears, nose, uterus etc. The anaemia of adolescent age, halīmaka roga, gastric and intestinal ulcers and their bleeding will be corrected by the use of 'loha bhasma'. It cures nāḍī śūla, sleeplessness due to anaemia, bone deformity due to āmavāta, both physical and psychological disturbances of menopause.

Its regular use strengthens the nervous system and helps in all types if vātaja roga. It is beneficial in reinstating the physical strength after suffering with any of the chronic or acute ailments.

### Loha bhasma- viśiṣṭha guṇa:

> शाखाश्रितं कोष्ठसमाश्रितं वा पित्तं विवृद्धन्तु मलाभिधेयम् ।
> मृतन्तु लौहं शमयेन्नितान्तं यथा समीरः खलु मेघवृन्दम् ।। (R. T. 20/97)

All types of pittaja roga situated in śākhā and koṣṭha will be effectively cured by judicious consumption of 'loha bhasma'. Simile: As the wind drives away the clouds, this 'loha bhasma' drives away all types of 'pittaja roga'.

### Loha bhasma- dosage:

> आरभ्य गुञ्जापादांशात् गुञ्जाद्वितयसंमितम् । मृतं लौहं प्रयुञ्जीत प्राणाचार्यः प्रयत्नतः ।।
> (R. T. 20/98)

Quarter rattī (31 mgs) to two rattī (250 mgs) is the general dosage of 'loha bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

### Loha bhasma- adjuvant:

> त्रिफलामधुसंयुक्तं सर्वरोगेषु योजयेत् । पथ्याशिनामयो भस्म यथोक्तगुणदं भवेत् ।।
> (Āy. Pra. 3/228)

Triphalā cūrṇa or triphalā kwātha and honey; with these adjuvant, 'loha bhasma' can be administered in all disease conditions. The other general adjuvant are; milk, ghee, butter, śuddha śilājatu or any other suitable adjuvant useful in that particular disease condition.

**Loha bhasma sevana apathya:**

कूष्माण्डं तिलतैलं च माषान्नं राजिका तथा । मद्यमम्लं मसूरांश्च त्यजेल्लोहस्य सेवक: ।।

(Āy. Pra. 3/229)

The incompatible foods during consumption of 'loha bhasma' are; kūṣmāṇḍa (cooked pumpkin), tilataila (sesame oil), māṣānna (rice cooked with black gram), rājika (āsurī), madya (alcohol), anna (cooked rice) and masūra (Lens culineris/lentil).

**Loha bhasma sevana- toxicity and measure:** (Ā. Pra. 3/230-233)

In case of any toxic effects during consumption of 'loha bhasma', the patient should be administered daily with 'agastya swarasa bhāvita viḍaṅga' along with 'agastya swarasa' until all symptoms subside.

**Loha bhasma- compound formulations:**

1. Loha parpaṭī
2. Navāyasa louha
3. Dhātrī louha
4. Pradarāntaka louha
5. Saptāmṛta louha
6. Ārogyavardhinī rasa
7. Candraprabhā vaṭī
8. Lohāsava

### 5. MAṆḌŪRA

(Iron Oxide)

**Introduction:**

Maṇḍūra is the 'rust of the iron' (Latin: *Rubrum*) with chemical formula $Fe_2O_3$. Rust is the general term used for 'red oxides', formed by the reaction of iron and oxygen in the presence of water or air moisture. Rust consists of hydrated iron (III) oxides $Fe_2O_3nH_2O$ and iron (III) oxide-hydroxide $FeO(OH)Fe(OH)_3$.

Given sufficient time, oxygen and water; any iron mass will eventually convert entirely to rust and disintegrate. Surface rust provides no protection to the underlying iron, unlike the formation of 'patina' on copper surfaces.

Rusting is the common term for corrosion of iron and its alloys, such as steel. Many other metals undergo equivalent corrosion, but the resulting oxides are not commonly called rust.

**Oxidation of iron metal:**

When impure (cast) iron is in contact with water, oxygen or other strong oxidants or acids, it rusts. If salt is present, for example in seawater or salt spray, the iron tends to rust more quickly, as a result of electrochemical reactions.

Iron metal is relatively unaffected by pure water or by dry oxygen. As with other metals, like aluminium, a tightly adhering oxide coating, a passivation layer, protects the bulk iron from further oxidation. The conversion of the passivating iron oxide layer to rust results from the combined action of two agents, usually oxygen and water.

**Maṇḍūra- swarūpa:**

प्रतापितस्य लोहस्य घनाघातच्युतं मलम् । कालेन पिण्डतां याति क्षितौ, मण्डूरमुच्यते ॥
(R. T. 20/123)

When iron is heated red hot and hit with heavy hammers in factories and in blacksmith's workshop, the 'rust' at the surface of the iron falls off to the ground. After few years, this rust is obtained as solidified iron-rust, which is identified as 'loha mala' or 'maṇḍūra'.

**Maṇḍūra- synonyms:**

मण्डूरं तु समाख्यातं किट्टं लोहभवं तथा । लोहकिट्टं लोहमलं लौहोच्छिष्टञ्च तन्मतम् ॥
(R. T. 20/124)

Kiṭṭa, lohabhava, lohakiṭṭa, lohamala, louhocchiṣṭa; are the synonymous words used for 'maṇḍūra' in classics.

**Maṇḍūra- types and their description:**

There are three types of 'maṇḍūra';

1. Muṇḍa loha kiṭṭa:

ईषच्छोणं गुरु स्निग्धं मुण्डकिट्टं जगुर्बुधाः । (Āy. Pra. 3/287)

It possesses red colour. It will be guru (heavy) and snigdha (smooth).

2. Tīkṣṇa loha kiṭṭa:

भिन्नाञ्जनप्रभं किट्टं विशेषाद् गुरु निर्व्रणम् । निष्कोटरश्च विज्ञेयं तीक्ष्णकिट्टं मनीषिभिः ॥
(Āy. Pra. 3/287)

It possesses the blackish colour like that of 'añjana'. It will be guru (heavy), nivraṇa (aberration free).

3. Kānta loha kiṭṭa:

पिङ्गं रूक्षं गुरुतमं मन्ददीर्घमकोटरम् । छिन्नं तु रजतच्छायं स्यात्किट्टं तच्च कान्तजम् ॥
(Āy. Pra. 3/288)

It possesses reddish black colour (piṅga varṇa). It will also be rūkṣya (rough), ati guru (more heavy), dīrgha (lengthy), akoṭhara (aberration free) and its cross section surface exhibits silver like shine.

dr.keshav_raj

**Maṇḍūra- grāhyatwa:**

षष्टिवर्षीयमधमं मध्यं सप्ततिवार्षिकम् । सर्वश्रेष्ठं समाख्यातं मण्डूरं शतवार्षिकम् ।।

(R. T. 20/125)

Maṇḍūra, which is 60 years old is considered 'adhama' (of inferior qualities); the 70 years old 'maṇḍūra' is considered 'madhyama' (of medium qualities); and 100 years old 'maṇḍūra' is considered 'sarva-śreṣṭha' (of best qualities).

- Another reference:

स्निग्धं गुरु दृढं चैव कृष्णं कोटरवर्जितम् । जीर्णं नष्टपुरःस्थञ्च मण्डूरं ग्राह्यमुच्यते ।।

(R. T. 20/126)

The 'maṇḍūra' that possesses 'snigdha' and 'guru' guṇa; which is hard and heavy, black and solid (with no hollow cavities inside); which is very old; and the one obtained from the place where there are signs of ancient civilization.

**Maṇḍūra śodhana- 1st method:**

ध्मातं विभीतकाङ्गारैर्गोमूत्रे परिषेचितम् । सप्तवारं लोहमलं शुद्धिमायात्यनुत्तमाम् ।।

(R. T. 20/127)

Maṇḍūra is heated red-hot over the intense fire produced by dry branches of 'bibhītakī' tree or heated over the glowing charcoal of same plant. Later it is dipped in the vessel containing enough quantity of 'cow's urine'.

This process of heating red-hot and dipping in enough quantity of 'cow's urine' is repeated for 7 times to obtain the 'maṇḍūra' purified.

Note: Fresh 'cow's urine' should be considered for each dipping.

**Maṇḍūra śodhana- 2nd method:**

प्रखरदहनतप्तं लोहकिट्टं पुराणं विपुलसुरभिमूत्रे सप्तवारं निषिक्तम् ।
निगदितविधियोगान्मारणायानुरूपां कलयति खलु शुद्धिं सत्वरं निर्विशेषाम् ।। (R. T. 20/128)

Maṇḍūra is heated red-hot over the glowing charcoal and dipped in the vessel containing enough quantity of 'cow's urine'. This process of heating red-hot and dipping in enough quantity of 'cow's urine' is repeated for 7 times to obtain the 'maṇḍūra' purified.

Note: Fresh 'cow's urine' should be taken for each dipping.

**Maṇḍūra māraṇa- 1st method:**

कन्या रसेन तच्चूर्णं मर्दयित्वा पुटे पचेत् । एवं सप्तपुटैर्भस्म मण्डूरस्य प्रजायते ।।

(Rasāmṛta 3/149)

The fine powder of 'śuddha maṇḍūra' is taken in a clean iron khalva yantra and subjected for one bhāvanā with 'kumārī swarasa'. Later it is dried under sun, enclosed in 'śarāva samputa' and subjected for one 'gajapuṭa'.

This entire process is repeated seven times to subject the drug for 7 'gajapuṭa'. With 7th puṭa, properly prepared, red coloured 'maṇḍūra bhasma' can be obtained.

### Maṇḍūra māraṇa- 2nd method:

चूर्णीकृतं तु मण्डूरं त्रिफलाक्वथिताम्भसा । सम्पेष्य सम्पुटे कृत्वा त्रिंशद्वारं ततः पुटेत् ।।
एवं नातिचिरादेव रक्तचन्दनसप्रभम् । मण्डूरं जायते तूर्णं ततो योगेषु योजयेत् ।।
लोहमारकगणोदितैस्तु तैर्भेषजैरपि सह प्रपेषितम् ।
लोहकिट्टमथ सम्पुटीकृतं पाचितं खलु समेति पञ्चताम् ।। (R. T. 20/129-131)

The fine powder of 'śuddha maṇḍūra' is taken in a clean iron khalva yantra and triturated thoroughly with enough quantity of 'triphalā kwātha'. Later it is dried under sun, enclosed in 'śarāva samputa' and subjected for 'gajapuṭa'.

This entire process is repeated 30 times to subject the drug for 30 'gajapuṭa'. With 30th puṭa, properly prepared, red coloured 'maṇḍūra bhasma' can be obtained. The 'maṇḍūra bhasma' prepared with this method can be used for all pharmaceutical and therapeutic purposes.

Alternatively, the fine powder of 'śuddha maṇḍūra' can be triturated thoroughly with swarasa or kwātha of any of the 'loha-māraka-gaṇa dravya', later dried under sun, enclosed in 'śarāva samputa' and subjected for 30 'gajapuṭa' to obtain properly prepared 'maṇḍūra bhasma'.

### Maṇḍūra bhasma- properties:

मण्डूरं सुमृतं वृष्यं शिशिरं रुचिरं परम् । दीपनं पित्तशमनं रक्तवृद्धिकरं परम् ।।
पाण्डुप्रमत्तमातङ्गमदमर्दनकेशरी । कामलाकुड्यकुलिशं मण्डूरं तु विशेषतः ।।
शोषप्रशमनञ्चैव तथा शोफप्रणाशनम् । हलीमकं च प्लीहानं मण्डूरं हन्त्यशेषतः ।।
(R. T. 20/132-34)

Properly prepared 'maṇḍūra bhasma' is 'vṛṣya' (aphrodisiac). It possesses 'śīta' guṇa. It is 'rucikāraka' and 'agnidīpaka'. It mitigates pitta doṣa and improves the haemoglobin percentage in the body. It is indicated in 'pāṇḍu roga', 'kāmalā roga', 'śoṣa roga', 'śotha roga', 'halīmaka roga' and 'plīhā vṛddhi'.

### Maṇḍūra bhasma- dosage:

आरभ्य गुञ्जापादांशाल्लोहमात्राविधानवित् । गुञ्जाद्वितयपर्यन्तं मण्डूरं विनियोजयेत् ।।
(R. T. 20/135)

Quarter rattī (31 mgs) to two rattī (250 mgs) is the general dosage of 'loha bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

Adjuvant: Triphalā cūrṇa or triphalā kwātha, honey, milk, ghee, butter, śuddha śilājatu or any other suitable adjuvant useful in that particular disease condition (same as that of loha bhasma).

**Maṇḍūra bhasma- compound formulations:**

1. Punarnavā maṇḍūra
2. Triphalā maṇḍūra
3. Śatāvarī maṇḍūra
4. Maṇḍūra vaṭaka

## 1. NĀGA (SĪSAKA)

(Lead; Pb)

### Nāga (Lead; Pb)- introduction:

Nāga (Lead) is the first 'pūti loha'. **Lead** is a prominent element in the carbon group with the symbol **Pb** (Latin: *plumbum*) and atomic number 82. It is also counted as one of the heavy metals. Metallic lead has a bluish-white color after being freshly cut, but it soon tarnishes to a dull greyish color when exposed to air. Lead has a shiny chrome-silver lustre when it is melted into a liquid.

It has a few characteristic properties—high density, softness, ductility and malleability, poor electrical conductivity (compared to other metals), high resistance to corrosion and ability to react with organic chemicals.

The metal is not attacked by sulphuric or hydrochloric acids. It dissolves in 'nitric acid' with the evolution of 'nitric oxide gas' to form dissolved $Pb(NO_3)_2$. It is a well-soluble solid in water; it is thus a key to receive the precipitates of halides, sulphate, chromate, carbonate and basic carbonate $Pb_3(OH)_2(CO_3)_2$ salts of lead.

### Health effects:

Exposure to lead and lead chemicals can occur through inhalation, ingestion and dermal contact. Most exposure occurs through ingestion or inhalation. Lead, at certain exposure levels, is a poisonous substance to humans. It damages the nervous system and causes brain disorders.

Excessive lead also causes blood disorders. Like the element mercury, another heavy metal, lead is a neurotoxin that accumulates in both soft tissues and the bones. Lead poisoning has been documented from ancient Rome, Ancient Greece, and Ancient China.

### Physical properties:

| | |
|---|---|
| Latin name | Plumbum (Lead) |
| Symbol | Pb |
| Atomic number | 82 |
| Atomic weight | 207.22 |
| Hardness | 1.5 |
| Specific gravity | 11.3 |
| Melting point | 326° C |
| Boiling point | 1524° C |
| Malleability | Good |
| Ductility | Poor |
| Conductivity | Poor conductor of heat and electricity |
| Corrosion | Resists corrosion by water and by sulphuric acid and other powerful chemicals |

### Nāga (lead)- brief history:

Nāga or sīsaka has a long history. Its references can be readily traced from literatures like Veda, Upaniṣad and Purāṇa. Its use for medicinal purposes was seen from 'Saṁhitā kāla'.

At many places of 'Caraka Saṁhitā', we find the references of 'nāga'. With the evolution of 'Rasaśāstra', the metal was extensively studied for its toxic effects, described and used as medicine.

Why the metal was called nāga?

During volcanic eruptions in mountainous volcanic areas, the molten lead (usually in association with zinc, silver and copper) with comparatively lower melting point, used to flow down the mountain peaks through small opening in between two rocks and solidify.

This solidified lead with bluish-white color turned to dull grey because of oxidation simulating a snake (black cobra) emerging in between small opening of two rocks. Because of this reason, the metal was called with the name 'nāga', which means snake.

### Occurrence:

Metallic lead does occur in nature, but it is rare. Lead is usually found in ore with zinc, silver and most abundantly copper; and is extracted together with these metals. In India, it is available in Kashmir, Punjab, Rajasthan, Bihar and Tamil Nadu. Overseas, its ores are found in US, Australia and Mexico.

**Lead ores:**

The main lead ore is 'Galena' ($PbS$) contains 86.6 % lead by weight. Other common varieties are 'Cerussite' (Lead carbonate; $PbCO_3$), 'Anglesite' (Lead sulphate; $PbSO_4$), 'Matlockite' (Lead chloride; PbCIF) and 'Litharge' (Lead oxide; $PbO$).

**Nāga- synonyms:**

सीसकं शीषकं सीसं नागकं नागनामकम् । कुवङ्गकं कुरङ्गञ्च तथा सिन्दूरकारणम् ॥

(R. T. 19/1)

Sīsaka, śīṣaka, sīsa, nāgaka, all names with which the snakes are identified (phaṇi, bhujaṅga, sarpa etc), kuvaṅgaka, kuraṅga and sindūra-kāraṇa; are the synonyms of lead (Pb) used in the classics.

**Nāga- types:**

नागं च द्विविधं प्रोक्तं कुमारं समलं तथा । कुमारं रसकार्येषु योजनीयं गुणाधिकम् ॥

(Bṛ. R. Rā. Su.)

Nāga will be of two varieties;

1. Kumāra nāga
2. Samala nāga

Out of these two varieties, 'kumāra nāga' is the one, which is used for therapeutic purposes.

**Nāga- grāhya swarūpa:**

सुगौरवं मृदु स्निग्धं छेदने मलिनोज्ज्वलम् । वहिःश्यामं द्रुतद्रावं सीसकं जात्यमादिशेत् ॥

(R. T. 19/2)

The 'lead' (Pb) which is heavy, soft and smooth; when cut exhibits dirty but shiny inner surface, which has black colour, and which melts abruptly after reaching the melting point; such a sample is the best variety of lead (Pb), which has to be selected for pharmaceutical and therapeutic purposes.

**Nāga- agrāhya swarūpa:**

वहिः शुक्लं भारहीनं रूक्षं छेदे च निष्प्रभम् । समलं कठिनद्रावं सीसकं हेयमादिशेत् ॥

(R. T. 19/3)

The lead (Pb) which exhibits whitish external surface, which is light in weight, when cut has no shiny inner part, which is dirty and which melts with difficulty; such a sample of lead (Pb) should not be selected for pharmaceutical or therapeutic use.

**Nāga śodhana- necessity:**

अशुद्धः कुरुते नागः प्रमेहक्षयकामलाः । तस्मात्संशुद्ध एवायं मारणीयो भिषग्वरैः ।।
(Āy. Pra. 3/188)

Internal administration of impure or improperly purified lead (Pb) in any form causes prameha roga, kṣaya roga and kāmalā roga. Therefore, the lead has to be properly purified before taking for incineration and eventually internal administration.

**Nāga śodhana- 1st method:**

सीसकं द्रावयेल्लोहदर्वीगतं स्वच्छचूर्णोदके चाथ निर्वापयेत् ।
पूर्वमार्गेण वै शेषकर्माचरेत् सीसकं सत्वरं याति शुद्धिं पराम् ।। (R. T. 19/10)

The 'aśuddha nāga' (lead; Pb) is taken in a clean bigger sized iron tablespoon. It is held over fire and heated. When it completely melts, the molten 'lead' is poured through 'pidhānaka yantra' into a vessel containing 'cūrṇodaka' (limewater). The solidified 'lead' is collected back, melted again and poured in fresh limewater.

Like this, the process of melting and pouring in fresh limewater is repeated for 7 times to obtain the 'lead' purified. Later it is dried and stored as 'śuddha nāga' for further pharmaceutical use.

**Nāga śodhana- 2nd method:**

सीसकं दर्विकासंस्थं चुल्लिकायां निधापयेत् । विद्रुतञ्चाथ विज्ञाय रसतन्त्रविचक्षणः ।।
सिन्दुवारशिफाजातस्वरसापूरितोदरे । क्षिपेद् घटे तु सच्छिद्रपिधानपिहितास्यके ।।
निर्वापयेत्सप्तवारं विधानज्ञो भिषग्वरः । इत्थं विशोधितं सीसं मारणाय प्रयोजयेत् ।।
(R. T. 1.

The 'aśuddha nāga' (Pb) is taken in a clean bigger sized iron tablespoon. It held over fire and heated. When it completely melts, the molten 'lead' is poured through 'pidhānaka yantra' into a vessel containing 'nirguṇḍī mūla swarasa'. The solidified 'lead' is collected back, melted again and poured in fresh 'nirguṇḍī mūla swarasa'.

Like this, the process of melting and pouring in fresh 'nirguṇḍī swarasa' is repeated for 7 times to obtain the 'lead' (Pb) purified. Later it is dried and stored as 'śuddha nāga' for further pharmaceutical use.

Note: Pidhānaka yantra is a closure placed over the vessel with a small opening in the middle. It can be a mud 'śarāva', a wooden or a metallic flank with a hole in the middle to pour the molten metal. If the molten metal is poured in the liquid of an open vessel, the metal jumps off the vessel and can be hazardous.

**Nāga māraṇa- 1st method:**

(With aśwattha vṛkṣa twak cūrṇa)

सीसकं शुद्धमादाय कटाहे गालयेद्भिषक् । विशुष्काश्वत्थवल्कोत्थं समं चूर्णं विनिक्षिपेत् ।।
स्वल्पं स्वल्पं मुहुश्चाथ लोहदर्व्या प्रचालयेत् । सीसभस्म भवेद्यावच्चूर्णं तावत्समापयेत् ।।
राशीकृत्य ततो भस्म शरावेण पिधापयेत् । ज्वलदङ्गारवर्णं स्यात्सीसभस्म यथा चिरम् ।।
स्वाङ्गशीतं ततो ज्ञात्वा मृतं सीसं समाहरेत् । बहुशः क्षालयेत्तोयैः क्षारहीनं यथा भवेत् ।।
सीसतुल्यां रोगशिलां विमलां तत्र निक्षिपेत् । निम्बूकवारिणा वाऽपि काञ्जिकेनाथ पेषयेत् ।।
सम्पुटस्थं ततः कृत्वा पुटयेदतियत्नतः । इत्थं त्रिभिः पुटैरेव सीसकं मृतिमाप्नुयात् ।।
द्वितीयादिपुटे वैद्यस्तुल्यामेव शिलां क्षिपेत् । इत्थं मृतं सीसकन्तु वीतशङ्कः प्रयाजयेत् ।।
भस्म सञ्जायते श्लक्ष्णं विशदं कज्जलप्रभम् । पक्षाघातादिकान् नागदोषान् नैव करोति च ।।

(R. T. 19/11-18)

In a wide mouthed iron vessel (kaḍhāhī), one part of 'śuddha nāga' (Pb; lead) is taken and the vessel is placed over intense fire. When the 'lead' melts completely, it is added little by little with one part of 'aśwattha vṛkṣa twak cūrṇa' and rubbed thoroughly with the base of a bigger iron spoon. This process is continued until all the 'aśwattha vṛkṣa twak cūrṇa' is added.

By this time, the 'lead' attains 'bhasma' form. It is now heaped up in the middle of the vessel, closed with an inverted mud lid (mṛt-śarāva) and subjected further to intense heat.

The mud lid is lifted to find whether the molten 'nāga bhasma' in the vessel appears reddish like fire. If so, the fire is stopped and allowed to cool on its own. Later the 'nāga bhasma' is collected and washed repeatedly with water to remove the alkalinity of the bhasma (refer the litmus test given below), because of the 'aśwattha vṛkṣa twak cūrṇa' used in the process.

Later the alkalinity free 'nāga bhasma' is added with equal quantity of 'śuddha manaḥśilā' and triturated thoroughly by adding required quantity of 'nimbū swarasa' or 'kāñji'. Later the powder is dried, enclosed in 'śarāva sampuṭa' and subjected for one 'puṭa' (laghupuṭa).

This process of adding 'śuddha manaḥśilā' and subjecting for 'puṭa' is repeated for three times to obtain appropriately prepared 'nāga bhasma'. This can be used for internal administration without any inhibitions.

The 'nāga bhasma' prepared with this method, will have jet-black colour like that of 'kajjalī'. This bhasma does not cause 'pakṣāghāta' and other types of 'nāga doṣa'.

**Litmus test:**

To remove the alkalinity in the 'nāga bhasma' during its preparation, the bhasma is repeatedly washed with water. To confirm the absence of alkalinity in 'bhasma', the washed water is tested each time by dipping a 'red litmus paper'. If the paper turns bluish in colour, it indicates the presence of alkalinity. If no, the bhasma is declared 'alkaline free'.

**Nāga māraṇa- 2nd method:**

(With apāmārga cūrṇa and vāsā mūla cūrṇa)

नागं विशुद्धन्तु कटाहसंस्थं प्रद्रावयेत्तीव्रतरानलेन् ।
द्रुतन्तु विज्ञाय भिषग्वरेण्यो मयूरचूर्णं क्रमशः क्षिपेद्वै ।।
वासां विशुष्कां च समान्तु दत्वा सञ्चालयेद्वै वृषदण्डदर्व्या ।
सुचूर्णितञ्चाथ विलोक्यं वैद्यः प्रक्षालयेदच्छजलेन कामम् ।।
चूर्णं समादाय ततो रसज्ञस्तुल्यां मनोज्ञां विमलां तु दत्त्वा ।
वासारसेनाथ विमर्द्य सम्यक् पुटेत् त्रिवारं रसतन्त्रवैद्यः ।।
भस्म सञ्जायते श्लक्ष्णं विशदं कज्जलप्रभम् । पक्षाघातादिकान् नागदोषान् नैव करोति च ।।
सुचिरं सेवनेनापि विकारान्नैव दर्शयेत् । अतो रसायनाचार्यो वीतशङ्कः प्रयोजयेत् ।।

(R. T. 19/24-28)

In a wide mouthed iron vessel (kaḍhāhī), one part of 'śuddha nāga' is taken and the vessel is placed over intense fire. When the 'lead' melts completely, it is added little by little with quarter part each of 'apāmārga cūrṇa' and 'vāsā mūla cūrṇa' and rubbed thoroughly with a wet shaft of 'vāsā' plant. This process is continued until all the 'apāmārga cūrṇa' and 'vāsā mūla cūrṇa' are added.

By this time, the 'lead' attains 'bhasma' form. Now the fire is put off and allowed to cool on its own. Later this 'bhasma' is collected and washed repeatedly with water to remove the alkalinity of the bhasma (refer the litmus test given above), because of the 'apāmārga cūrṇa' and 'vāsā mūla cūrṇa' used in the process.

Later the alkalinity free 'nāga bhasma' is added with equal quantity of 'śuddha manaḥśilā' and triturated thoroughly by adding required quantity of 'vāsā swarasa'. Later the powder is dried, enclosed in 'śarāva sampuṭa' and subjected for one 'puṭa' (laghupuṭa).

This process of adding 'śuddha manaḥśilā' and subjecting for 'puṭa' is repeated for three times to obtain appropriately prepared 'nāga bhasma'. This can be used for internal administration without any inhibitions.

The 'nāga bhasma' prepared with this method, will be soft and jet-black coloured like that of 'kajjalī'. This bhasma may be used for internal administration for longer periods. Even then it does not cause 'pakṣāghāta' and other types of 'nāga doṣa'. Therefore, the bhasma prepared with this method can be used for therapeutic purposes with no fear of lead toxicity.

**Nāga māraṇa- 3rd method:**

(With śuddha manaḥśilā and śuddha gandhaka)

> विशुद्धं सीसमादाय कटाहे तु निधापयेत् । चुल्लिकायां निधायाथ वह्निं प्रज्वाल्य गालयेत् ।।
> सीसकं विद्रुतं ज्ञात्वा स्वल्पं स्वल्पं मुहुर्मुहुः । विशुद्धकुनटीचूर्णं तुल्यं दत्वा विमर्दयेत् ।।
> सीसभस्म भवेद् यावच्चूर्णं तावत्समापयेत् । स्वतः शीतं ततो ज्ञात्वा सीसभस्म समाहरेत् ।।
> भस्मतुल्यं वलिं दत्त्वा निम्बुनीरेण मर्दयेत् । घर्मे विशोष्य यत्नेन संपुटस्थं ततः पुटेत् ।।
> इत्थं त्रिभिः पुटैरेव सीसकं मृतिमाप्नुयात् । इत्थं मृतं सीसकन्तु वीतशङ्कः प्रयोजयेत् ।।
>
> (R. T. 19/19-23)

In a wide mouthed iron vessel (kaḍhāhī), one part of 'śuddha nāga' (Pb; lead) is taken and the vessel is placed over intense fire. When the 'lead' melts completely, it is added little by little with one part of 'śuddha manaḥśilā cūrṇa' and rubbed thoroughly with the base of a bigger iron spoon. This process is continued until all the 'śuddha manaḥśilā cūrṇa' is added.

By this time, the 'lead' attains 'bhasma' form. Now the fire is put off and allowed to cool on its own. Later the 'bhasma' is taken in a clean khalva yantra and added with equal quantity of 'śuddha gandhaka'.

This mixture is added with required quantity of 'nimbū swarasa', thoroughly triturated and later dried under sun. This dry powder is enclosed in 'śarāva sampuṭa' and subjected for one 'puṭa' (laghupuṭa).

This process of adding 'śuddha gandhaka' and subjecting for 'puṭa' is repeated for three times to obtain appropriately prepared 'nāga bhasma'. This can be used for internal administration without any inhibitions.

**Nāga māraṇa- 4th method:**

(With śuddha pārada and śuddha gandhaka)

> नागं विशुद्धं तु निधाय दर्व्यां प्रद्रावयेत्तीव्रतरानलेन ।
> द्रुतं समालोक्य भिषग्वरेण्यः पादांशमीशं द्रुमेतव दद्याद् ।।

द्रुतन्तु भूमाववतार्य खल्वे सम्पेषयेत्सत्वरमेव यत्नात् ।
प्रक्षाल्य साम्लेन जलेन नूनं विशोष्य नीरं विदधीत चूर्णम् ।।
निक्षिप्य सीसाद् द्विगुणन्तु गन्धं सम्पेषयेद्यामयुगं प्रयत्नात् ।
विलोक्य चूर्णं खलु कज्जलाभं निधापयेद्वैद्यवरः शरावे ।।
शरावसंपुटस्थितं पुटेल्लघौ पुटे ततः । स्वतः सुशीततां गते शरावमाहरेद्भिषक् ।।
विभिद्य सम्पुटात्ततः शुभं सुकज्जलप्रभम् । मृतन्तु सीसमाहरेद्रसायनागमार्यमा ।।
(R. T. 19/29-33)

Required quantity of 'śuddha nāga' is taken in a clean loha darvī and heated to liquify it completely. This molten 'nāga' is soon poured into the khalva yantra and added with equal quantity of 'śuddha pārada'. Soon the mixture is triturated rigorously to obtain the drug mixture in the form of amalgam.

This amalgam is thoroughly washed with any of the 'amla dravya' (nimbū rasa) and dried under sun. This powder is again taken in khalva yantra, added with double quantity of 'śuddha gandhaka' and triturated for two yāma (6 hours) to obtain jet black coloured fine powder like that of kajjalī.

This powder is enclosed in 'śarāva sampuṭa' and subjected for one laghupuṭa. When cool on its own, the black coloured, smooth bhasma of 'nāga' is collected and stored in airtight container.

**Nāga māraṇa- 5th method:**
(With śuddha haratāla)

चूर्णैर्मयूरादिसमुत्थितैस्तु चूर्णीकृतं सीसकमग्नियोगात् ।
प्रक्षाल्य च क्षारहन्ति विधाय सीसार्द्धमानं विमलालचूर्णम् ।।
दत्त्वाथ सम्पेष्य शरावसंस्थं पुटेत्प्रमाणाहपुटै रसज्ञः ।
स्वतः सुशीतन्तु विलोक्य विद्वान् समाहरेत्सम्पुटकं प्रयत्नात् ।।
रीत्यानया नातिचिरेण नूनमनुत्तमां याति मृतिन्तु सीसम् ।
विलुप्तशङ्को भिषजां वरेण्यः प्रयोजयेद् भूतिमिमां रसेषु ।। (R. T. 19/34-36)

In a wide mouthed iron vessel (kaḍhāhī), one part of 'śuddha nāga' is taken and the vessel is placed over intense fire. When the 'lead' melts completely, it is added little by little with quarter part each of 'apāmārga cūrṇa', 'vāsā mūla cūrṇa' and 'pippalī twak cūrṇa' and rubbed thoroughly with the base of the 'loha darvī'. This process is continued until all the powders are added.

By this time, the 'lead' attains 'bhasma' form. Now the fire is put off and allowed to cool on its own. Later this 'bhasma' is collected and washed repeatedly with water to remove the alkalinity of the bhasma (refer the litmus test given above), because of the herbal powders used in the process.

Later the alkalinity free 'nāga bhasma' is added with equal quantity of 'śuddha haratāla' and triturated. This powder is enclosed in 'śarāva sampuṭa' and subjected for one 'puṭa' (laghupuṭa).

This process of adding 'śuddha haratāla' and subjecting for 'puṭa' is repeated for three times to obtain appropriately prepared 'nāga bhasma'. This can be used for internal administration without any inhibitions.

### Nāga māraṇa- 6th method:

(With śuddha manaḥśilā)

> नागं कटाहनिहितं द्रावयेद् वह्नियोगतः । ततः शुद्धशिलाचूर्णं स्वल्पं स्वल्पं मुहुर्मुहुः ।।
> समांशेन तु निक्षिप्य लोहदर्व्या प्रचालयेत् । नागभस्म भवेद्यावच्चूर्णं तावत्समापयेत् ।।
> ततः सीसोन्मितां शुद्धां शिलां दत्त्वा भिषग्वरः । रविदुग्धेन सम्पेष्य पुटयेदतियत्नतः ।।
> एवं नातिचिरादेव नागकं मृतिमाप्नुयात् । इत्थं मृतं नागकन्तु सर्वयोगेषु योजयेत् ।।

(R. T. 19/37-40)

In a wide mouthed iron vessel (kaḍhāhī), one part of 'śuddha nāga' (Pb; lead) is taken and the vessel is placed over intense fire. When the 'lead' melts completely, it is added little by little with one part of 'śuddha manaḥśilā cūrṇa' and rubbed thoroughly with the base of a bigger iron spoon. This process is continued until all the 'śuddha manaḥśilā cūrṇa' is added.

By this time, the 'lead' attains 'bhasma' form. Now the fire is put off and allowed to cool on its own. Later the 'bhasma' is taken in a clean khalva yantra, added with equal quantity of 'śuddha manaḥśilā' and triturated. This mixture is added with required quantity of 'arka kṣīra', triturated thoroughly and later dried under sun.

The dry powder obtained is enclosed in 'śarāva sampuṭa' and subjected for one 'puṭa' (laghupuṭa) to obtain appropriately prepared 'nāga bhasma'. This can be used for internal administration or in any compound formulation without any inhibitions.

### Nāga māraṇa- 7th method:

(With śuddha gandhaka)

> सीसकं द्रावयेत्सत्कटाहस्थितं विद्रुतं वीक्ष्य वै वैद्यविद्याचणः ।
> निक्षिपेच्चूर्णितं शुद्धसौगन्धिकं सीसकं सर्वथा याति यावन्मृतिम् ।।
> वीक्ष्य सम्यङ् मृतं सीसकं कोविदः स्वाङ्गशीते सति त्वाददीत द्रुतम् ।
> सीसमेवं मृतं वीतशङ्को भिषग्योजयेत्सर्वथा बाह्ययोगेऽनिशम् ।।

(R. T. 19/41-42)

In a wide mouthed iron vessel (kaḍhāhī), one part of 'śuddha nāga' (Pb; lead) is taken and the vessel is placed over intense fire. When the 'lead' melts completely, it is added little by little with one part of 'śuddha gandhaka cūrṇa' and rubbed thoroughly with the base of a bigger iron spoon. This process is continued until all the 'śuddha gandhaka' is added.

By this time, the 'lead' attains 'bhasma' form. When cool on its own, this bhasma is triturated thoroughly and stored in airtight container as 'nāga bhasma'. The bhasma prepared with this method is meant for external use only.

**Nāga bhasma- properties and indication:**

मृतन्तु सीसं मधुरञ्च तिक्तं स्निग्धं तथोष्णां गुरु लेखनञ्च ।
सरं तथा वह्निविवर्द्धनञ्च रसागमज्ञैः खलु सम्प्रदिष्टम् ॥ (R. T. 19/43)
अपि च-
प्रमेहकरिकेशरी पवनरोगकालानलः ग्रहव्यतिनिशारुणः खलु गुदाङ्कुरेभाङ्कुशः ।
बलासगदतस्करो व्रणगणौकसङ्कर्षणः परं विजयतेतरां गदहरो भुजङ्गा मृतः ॥ (R. T. 19/44)
अपि च-
नागस्तु नागसमतां द्रुतमातनोति गुल्मद्विपं दलयतीह चिरप्रमत्तम् ।
घोरं हरेत्प्रदरमाशु हि रक्तपूर्वं तूर्णन्तु रोगनिर्वहान् विनिहन्ति नूनम् ॥ (R. T. 19/45)

Properly prepared 'nāga bhasma' possesses madhura and tikta rasa; and snigdha, uṣṇa, guru, lekhana and sara guṇa. It improves the digestive power. It is useful in curing 'prameha roga', 'vātavyādhis', 'grahaṇī roga', 'haemorroids', 'kaphaja roga' and all types of 'vraṇa' (wounds).

Its judicious use improves the physical strength. It cures 'gulma roga' and severe 'rakta-pradara'. This bhasma can cure all these diseases effectively.

Note: There are 'similes' given with each line in the verse, which are non-relevant.

**Nāga bhasma- dosage:**

पादांशतो रक्तिकाया रक्तिकैकमितं शुभम् । मृतं सीसं प्रयुञ्जीत बलकालाद्यपेक्षया ॥ (R. T. 19/46)

Quarter rattī (31 mgs) to one rattī (125 mgs) is the general dosage of 'nāga bhasma'. However, the dosage is finalized after thorough consideration of all the relevant factors that affect the dosage.

**Lead toxicity- antidote:**

अविशुद्धामृताद्युत्थविकारपरिशान्तये । विशुद्धगन्धं चूर्णन्तु योजयेद् भिषजां वरः ॥ (R. T. 19/93)

In case of 'toxic symptoms' resulting due to consumption of improperly purified 'lead' in any form, the 'śuddha gandhaka' should be administered daily as antidote to bring down the symptoms.

**Nāga bhasma- compound formulations:**

1. Trailokyacintāmaṇi rasa
2. Māṇikya rasa
3. Kṣayakeśarī rasa
4. Jwarāri rasa
5. Ratnagarbha-poṭṭalī rasa
6. Sūcikābharaṇa rasa
7. Kālānala rasa
8. Yogeśwara rasa

## 2. VAṄGA

(Tin; Sn)

**Vaṅga (tin)- general information:**

Vaṅga (tin) is the second 'pūti loha'. **Tin** is a chemical element with the symbol **Sn** (Latin: *stannum*) and atomic number 50. It is a main group metal in group 14 of the periodic table.

**Tin** extraction and use can be dated to the beginnings of the Bronze Age around 3000 BC. It is a malleable, ductile and crystalline silvery-white metal. When a bar of tin is bent, a crackling sound known as the **'tin cry'** can be heard due to the twinning of the crystals. Tin melts at a low temperature of about 232° C.

**Physical properties:**

Commercial grades of tin (99.8%) resist transformation because of the inhibiting effect of the small amounts of bismuth, antimony, lead and silver present as impurities. Alloying elements such as copper, antimony, bismuth, cadmium and silver increase its hardness.

Tin tends rather easily to form hard, brittle intermetallic phases, which are often undesirable. It does not form wide solid solution ranges in other metals in general, and there are few elements that have appreciable solid solubility in tin. Simple eutectic systems, however, occur with bismuth, gallium, lead, thallium and zinc.

Tin becomes a superconductor below 3.72 K. In fact, tin was one of the first superconductors to be studied; the Meissner effect, one of the characteristic features of superconductors, was first discovered in superconducting tin crystals.

**Chemical properties:**

Tin resists corrosion from water but can be attacked by acids and alkalis. Tin can be highly polished and is used as a protective coat for other metals. In this case, the formation of a protective oxide layer is used to prevent further oxida-

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tion. This oxide layer forms on pewter and other tin alloys. Tin acts as a catalyst when oxygen is in solution and helps accelerate chemical attack.

**Physical properties:**

| | |
|---|---|
| Latin name | Stannum (Tin) |
| Symbol | Sn |
| Atomic number | 50 |
| Atomic weight | 118.70 |
| Hardness | 6.7 |
| Density | 7.3 |
| Melting point | 232° C |
| Boiling point | 2270° C |
| Malleability | Is very good, so used for making different shapes |
| Conductivity | Very good conductor of heat and electricity |
| Atmospheric exposure | Remains unaffected by dry air but corrodes in moisture |

**Vaṅga (tin)- brief history:**

The term 'vaṅga' is indicative form of 'Bengal'. In ancient days, this metal was imported to India from south East Asian countries through the 'ports of Bengal' by sea route. Since the metal was supplied in India from Bengal, it was named as 'Baṅga', which eventually became 'Vaṅga'.

Vaṅga has a long history. Its references can be readily traced from literatures like Veda, Upaniṣad and Purāṇa. Its use for medicinal purposes was seen from 'Saṁhitā kāla'.

At many places of 'Caraka Saṁhitā' and consecutive grantha, we find the references of 'vaṅga'. With the evolution of 'Rasaśāstra', the metal was extensively studied for its toxic effects, described and used as medicine.

**Tin- occurrence:**

Tin is the 49th most abundant element in the Earth's crust, representing 2 ppm compared with 75 ppm for zinc, 50 ppm for copper, and 14 ppm for lead. Tin does not occur as the 'native element' but must be extracted from various ores.

Deposits of 'tin' are reported to be in southern Mongolia, Colombia, South America, Australia, South Africa, China, Siberia and Malaysia. In India, it is found abundantly in Bihar.

**Tin ores:**

**Cassiterite (SnO$_2$)** is the only commercially important ore of tin, although small quantities of tin are recovered from complex sulfides such as **'stannite'**, **'cylindrite'**, **'franckeite'**, **'canfieldite'** and **'teallite**. Minerals with tin are almost always associated with granite rock, usually at a level of 1% tin oxide content.

**Vaṅga (tin)- synonyms:**

वङ्गञ्च वङ्गकं रङ्गं रङ्गकं शुक्रलोहकम् । कुरूप्यं त्रपुसञ्चैव त्रपुष त्रपु कीर्तितम् ।। (R. T. 18/1)

Vaṅga, vaṅgaka, raṅga, raṅgaka, śuklaloha, kurūpya, trapusa, trapuṣa, trapu; all these are the synonymous words used in the classics for the metal 'tin' (Sn).

**Vaṅga- types:**

खुरकं मिश्रकं चेति वङ्गकं द्विविधं मतम् । खुरकं श्रेष्ठमाख्यातं मिश्रकं त्ववरं परोप्तम् ।।
(R. T. 18/2)

खुरकं मिश्रकञ्चेति द्विविधं वङ्गमुच्यते । खुरं तत्र गुणैः श्रेष्ठं मिश्रकं न हितं मतम् ।।
(R. R. S. 5/153)

There are two types of vaṅga specified in classics;

1. Khuraka vaṅga (śreṣṭha)
2. Miśraka vaṅga (avara)

Out of these two the 'khuraka vaṅga' is considered as 'śreṣṭha' (best variety) and 'miśraka vaṅga' as 'avara' (of low qualities) variety.

**Khuraka vaṅga- swarūpa:**

मृदुलं निर्मलञ्चैव चन्द्रलोहसमप्रभम् । दुतद्रावञ्च निःशब्दं खुरकं समुदीरितम् ।। (R. T. 18/3)

Khuraka vaṅga will be soft and clean. It possesses the radiance of silver (candra loha) and melts abruptly after reaching the melting point. It produces no sound while melting (niśabda).

Note: If the metal is adulterated with tāmra or any other metal, while melting it produces sound. Similar opinion is expressed by another reference given below;

धवलं मृदुलं स्निग्धं द्रुतद्रावं सगौरवम् । निःशव्दं खुरवङ्गं स्यान्मिश्रकं श्यामशुभ्रकम् ।।
(R. R. S. 5/154)

**Miśraka vaṅga- swarūpa:**

द्रावेऽतिकठिनं रूक्षं त्वन्यधातुविमिश्रितम् । धूसरं कठिनञ्चैव मिश्रकं वङ्गमुच्यते ।।
(R. T. 18/4)

The vaṅga (tin) that melts with difficulty and has rough outer surface. The one that possesses 'dhūsara' (greyish) varṇa and is very hard. All these features are found only in 'tin' (vaṅga) containing other metals in it; therefore, it is called as 'miśraka vaṅga'

### Vaṅga- grāhyāgrāhyatwa:

खुरकाख्यं शुक्रलोहं मारणाय प्रशस्यते । मिश्रकं हेयमाख्यातं रसतन्त्रविचक्षणैः ।। (R. T. 18/5)

Out of 'khuraka vaṅga' and 'miśraka vaṅga', the first one is considered fit for pharmaceutical (śodhana and māraṇa) as well as therapeutic use (internal administration). Whereas the 'miśraka vaṅga' is considered unfit for both pharmaceutical and therapeutic purposes.

### Vaṅga śodhana- necessity:

अशुद्धममृतं वङ्गं प्रमेहादिगणप्रदम् । गुल्महृद्रोगशूलार्शः कासश्वासवमिप्रदम् ।। (Āy. Pra. 3/154)

Aśuddha vaṅga (impure tin) or asamyak mṛta vaṅga (improperly incinerated tin) if administered internally, it causes prameha roga, gulma roga, hṛdroga, śūla, arśa, kāsa, śwāsa and vamana. Therefore, it is most essential to purify and incinerate the drug properly before using it for therapeutic purposes.

### Vaṅga śodhana- 1st method:

खुराभिधानं खलु शुक्रलोहं निधाय दर्व्यां भिहपजां वरेण्यः ।
चुल्लीगतञ्चाप्यथ गालयित्वा विशुद्धचूर्णोदकपूर्णगर्भे ।।
गाढन्तु सच्छिद्रपिधानकेन क्षिपेत्समाच्छन्नमुखे तु कुम्भे ।
इत्थं निषिक्तं भिषजाश्ववारं वङ्गं विशुद्धिं समुपैति नूनम् ।। (R. T. 18/8-9)

The 'aśuddha vaṅga' (Tin; Sn) is taken in a clean bigger sized iron tablespoon. It is held over fire and heated. When it completely melts, the molten 'tin' is poured through 'pidhānaka yantra' into a vessel containing 'cūrṇodaka' (limewater). The solidified 'tin' is collected back, melted again and poured in fresh limewater.

Like this, the process of melting and pouring in fresh limewater is repeated for 7 times to obtain the 'tin' purified. With each pouring, the 'tin' becomes brighter in appearance. Later it is dried and stored as 'śuddha vaṅga' for further pharmaceutical use.

Note: Pidhānaka yantra is a closure, placed over the vessel with a small opening in the middle. It can be a mud 'śarāva', a wooden or a metallic flank with a hole in the middle to pour the molten metal. If the molten metal is poured in the liquid of an open vessel, the metal jumps off the vessel and can be hazardous.

**Vaṅga śodhana- 2nd method:**

वङ्गकं गालितं लोहदर्वीगतं सूर्यदुग्धे भृशञ्चैव निर्वापयेत् ।
पूर्वमार्गेण वै शेषकर्माचरेत् सत्वरं वङ्गकं याति शुद्धिं पराम् ।। (R. T. 18/10)

The 'aśuddha vaṅga' (Tin; Sn) is taken in a clean bigger sized iron tablespoon. It is held over fire and heated. When it completely melts, the molten 'tin' is poured through 'pidhānaka yantra' into a vessel containing 'arka dugdha'. The solidified 'tin' is collected back, melted again and poured in fresh arka dugdha.

Like this, the process of melting and pouring in fresh arka dugdha is repeated for 7 times to obtain the 'tin' purified. With each pouring, the 'tin' becomes brighter in appearance. Later it is dried and stored as 'śuddha vaṅga' for further pharmaceutical use.

**Vaṅga śodhana- 3rd method:**

वङ्गकं द्रावितं सिन्दुवारद्रवे रात्रियुक्तं त्रिधा चेह निर्वापयेत् ।
शेषकर्माचरेत् पूर्वमार्गेण वै शुक्रलोहं द्रुतं याति शुद्धिं पराम् ।।
द्रावितस्य तु वङ्गस्य द्रवादौ परिषेचने । औचित्येनाचरेन्नो चेदुत्प्लुत्योत्प्लुत्य निर्दहेत् ।।

(R. T. 18/11-12)

The 'aśuddha vaṅga' (Tin; Sn) is taken in a clean bigger sized iron tablespoon. It is held over fire and heated to melt the tin (vaṅga). When it completely melts, the molten 'tin' is poured through 'pidhānaka yantra' into a vessel containing 'nirguṇḍī swarasa' containing 'haridrā cūrṇa'. The solidified 'tin' is collected back, melted again and poured in fresh 'haridrā cūrṇayukta nirguṇḍī swarasa'.

Like this, the process of melting and pouring in fresh 'haridrā cūrṇayukta nirguṇḍī swarasa' is repeated for 3 times to obtain the 'tin' purified. With each pouring, the 'tin' becomes brighter in appearance. Later it is dried and stored as 'śuddha vaṅga' for further pharmaceutical use.

**Vaṅga śodhana- 4th method:**

वङ्गं प्रद्राव्य यत्नेन लोहदर्वीगतं ततः । निर्वापयेदम्लतक्रे पूर्वोक्तविधिना भिषक् ।।
ततः कुमारिकाद्रावे तद्वदेव निषेचयेत् । अनेन विधिना वङ्गं शुद्धिमायाति सर्वथा ।।

(R. T. 18/13-14)

The 'aśuddha vaṅga' (Tin; Sn) is taken in a clean bigger sized iron tablespoon. It is held over fire and heated to melt the 'tin' (vaṅga). When it completely melts, the molten 'tin' is poured through 'pidhānaka yantra' into a vessel containing 'sour buttermilk'. The solidified 'tin' is collected back, melted again and poured in fresh 'sour buttermilk'. This process of melting and pouring in fresh 'sour buttermilk' is repeated for 3 times.

Later the solidified metal is again melted and poured in 'kumārī swarasa' as per above method. This process is also repeated for 3 times to obtain the 'tin' purified. With each pouring, the 'tin' becomes brighter in appearance. Later it is dried and stored as 'śuddha vaṅga' for further pharmaceutical use.

**Vaṅga jāraṇa and māraṇa:**

The concept of 'vaṅga māraṇa' can be perceived in two stages;

1. Vaṅga jāraṇa
2. Vaṅga māraṇa

Vaṅga 'jāraṇa' or 'jīrṇana' is the initial part of the 'māraṇa' procedure, carried out to reduce 'particles of vaṅga' to a finer state of subdivision. By doing so, the further procedure of 'vaṅga māraṇa' will be lot more easier.

**Vaṅga jāraṇa:**

> शुद्धं वङ्गं क्षिपेद्धण्ड्यां चुल्लिस्थायां शनैः शनैः । तदधो ज्वालयेदग्नि द्रुते वङ्गे क्षिपेत्पुनः ।।
> अपामार्ग चतुर्थांशं चूर्णं संञ्चालयेदिदम् । स्थूलाग्रया ह्ययोदर्व्या यावत्तद्भस्म जायते ।।
> चूर्णं प्रक्षेपणं कार्यं स्वल्पं स्वल्पं मुहुर्मुहुः । यावद्भस्मं भवेद्वङ्गं तावच्चूर्णं समापयेत् ।।
> शरावपिहितं पश्चात् स्थापयेत्तत्र तद्भिषक् । रजः सर्वं ततोऽधस्तात्कुर्यादग्निं तु तीव्रकम् ।।
> यावदङ्गारवर्णं तद्रजः समुपजायते । स्वाङ्गशीतं ततो ग्राह्यं मारणाय रजः शुभम् ।।
>
> (Āy. Pra. 3/155-159)

In a wide mouthed iron vessel (kaḍhāhī), one part of 'śuddha vaṅga' is taken and the vessel is placed over intense fire. When the 'tin' melts completely, it is added little by little with quarter part of 'apāmārga cūrṇa' and rubbed thoroughly with the base of a bigger iron spoon. This process is continued until all the 'apāmārga cūrṇa' is added.

By this time, the 'tin' attains 'bhasma' form (fine powder form). It is now heaped up in the middle of the vessel, closed with an inverted mud lid (mṛt-śarāva) and subjected further to intense heat for a day.

The mud lid is lifted to find whether the molten 'vaṅga bhasma' in the vessel appear reddish like fire. If so, the fire is stopped and allowed to cool on its own. The fine powder of the drug obtained is 'jārita vaṅga', which is taken for the purpose of incineration.

Note: The same procedure is explained in 'Rasataraṅgiṇī' 18/19-24; but as 'vaṅga māraṇa'. The texts 'Rasataraṅgiṇī' and 'Rasaratnasamuccaya' do notdifferentiate between 'vaṅga jāraṇa' and 'vaṅga māraṇa'. However, the reference of 'Āyurveda Prakāśa' given below clearly explains 'vaṅga jāraṇa' method.

**Vaṅga māraṇa- 1st method:**

विशुद्धं वङ्गमादाय कटाहे गालयेद्भिषक् । पादांशिकविशुद्धञ्च तत्र सूतं विनिक्षिपेत् ।।
दत्त्वा सम्मर्द्य यत्नेन द्रुतमेवावतारयेत् । वंगार्द्धं तालकं दत्त्वा खल्वे सम्पेषयेत्ततः ।।
श्लक्ष्णचूर्णं ततः कृत्वा रविदुग्धेन मर्दयेत् । पिप्पलत्वक्समुत्थाच्छक्षारमध्यगतं भिषक् ।।
शरावसंपुटे न्यस्य लावकाख्यपुटे पुटेत् । इत्थं पुटद्वयेनैव वंगं तु मृतिमाप्नुयात् ।।

(R. T. 18/25-28)

In a wide mouthed iron vessel (kaḍhāhī), one part of 'śuddha jārita vaṅga' is taken. The vessel is placed over intense fire and the metal (tin) is melted. It is now added with 1/4th part of 'śuddha pārada' and stirred.

When both 'tin' and 'mercury' become one, the vessel is taken out from fire and the content is poured into a clean khalva yantra. It is now added with half part of 'śuddha haratāla cūrṇa' and triturated thoroughly to obtain the mixture in powder form.

In this powder, required quantity of 'arka dugdha' is added and triturated to prepare the pellets (cakrikās) of even size and shape. These pellets are later dried under sun.

Now in a 'śarāva', half the part is filled with 'aśwattha vṛkṣa twak bhasma', over that, the dry pellets are placed and above that, again 'aśwattha vṛkṣa twak bhasma' is filled up to the brim of 'śarāva'. It is now covered inverted with another even sized 'śarāva' and sealed to prepare 'śarāva sampuṭa'.

This 'sampuṭa' is subjected for 'lāvaka puṭa'. When cool on its own, the drug material inside the 'sampuṭa' is collected, triturated again with 'arka dugdha', pellets are prepared, dried and subjected for one more 'lāvaka puṭa' as said above. Like this two 'lāvaka puṭa' will yield appropriate 'vaṅga bhasma'.

To remove the alkalinity of the bhasma, because of the 'aśwattha vṛkṣa twak cūrṇa' used in the process, the bhasma is repeatedly washed with water. The washed water is tested for alkaline content with 'litmus test', later dried, and stored in airtight container as 'vaṅga bhasma'.

**Vaṅga māraṇa- 2nd method:**

वङ्गं सतालमर्कस्य पिष्ट्वा दुग्धेन तत्पुटेत् । शुष्काश्वत्थभवैर्वल्कैः सप्तधा भस्मतां व्रजेत् ।।

(*Āy. Pra.* 3/170)

One part of 'jārita vaṅga cūrṇa' is taken in a clean khalva yantra. It is added with desired ratio (1, 1/2, 1/4, 1/8 or 1/16 part) of 'śuddha haratāla' and triturated to obtain a homogenous mixture.

This mixture is now added with required quantity of 'arka dugdha' and triturated to prepare 'cakrikās' of even size and shape. Later these 'cakrikās' are dried under hot sun.

Now a suitable 'mṛt-śarāva' is taken. Half of it is filled with 'aśwattha twak cūrṇa'. Over that the dry 'cakrikās' are placed and again 'aśwattha twak cūrṇa' is poured over them up to the brim of the 'śarāva'.

This 'śarāva' is now covered inverted with another 'śarāva' of equal size and sealed to prepare 'śarāva sampuṭa'. This 'śarāva sampuṭa' is subjected for one 'kukkuṭa puṭa'.

All this procedure is repeated seven times to subject the drug for 7 kukkuṭapuṭa. With 7th puṭa, soft white bhasma of 'vaṅga' is obtained, which should be later stored in suitable airtight container as 'vaṅga bhasma'.

Note: Practically if 'kukkuṭa puṭa' does not yield properly prepared 'vaṅga bhasma', one may subject the drug for required number of 'gajapuṭa'.

**Vaṅga māraṇa- 3rd method:**

पलाशद्रवयुक्तेन वङ्गपत्रं प्रलेपयेत् । तालेन पुटितं पश्चान्म्रियते नात्र संशयः ।। (R. R. S. 5/161)

The 'śuddha vaṅga' is melted over agni and made in the form of soft foils. Over these foils, the paste of 'śuddha haratāla' (prepared by triturating with required quantity of 'palāśa mūla swarasa' or 'palāśa twak kwātha') is applied and dried.

Now these foils are enclosed in 'śarāva sampuṭa' and subjected for one laghupuṭa (kukkuṭa puṭa). All this procedure is repeated for 4 to 5 times to subject the drug for those many number of puṭa.

With final puṭa, appropriately prepared, soft and white coloured 'vaṅga bhasma' is obtained, which can be used for internal administrations without any inhibitions.

Note: The paste of 'śuddha haratāla' said above can be applied for the foils of 'tin' only before first puṭa. Later the drug obtained from 1st puṭa is triturated with 'palāśa mūla swarasa' or 'palāśa twak kwātha', enclosed in 'śarāva sampuṭa' and subjected for 2nd puṭa and similarly for consecutive puṭa.

**Vaṅga bhasma and the alkalinity test:**

क्षारशून्यत्वविज्ञान भिषजां स्यात्कथं स्वतः । रसायनात्क्रमार्गेण सर्व तदुपदिश्यते ।।
रक्तं वर्णकपत्रं चेद्भावनाम्भसि संस्थितम् । सर्वथा नीलदां नैति क्षारशून्यं ततो वदेत् ।।

(R. T. 18/34-35)

To remove the alkalinity from any of the bhasmas prepared with any of the 'kṣārayukta dravya' (apāmārga, aśwattha, ciñcā etc) and make it fit for internal administration, the bhasma is repeatedly washed with water.

To confirm the absence of alkalinity in 'bhasma', the washed water is tested each time by dipping a 'red litmus paper'. If the paper turns bluish in colour, it indicates the presence of alkalinity. If no, the bhasma is declared 'alkaline free' and stored in suitable airtight containers for further therapeutic use.

**Vaṅga bhasma- its uṣṇa and śita guṇa:**

वङ्गं गन्धादियोगेन मारितं तूष्णतां व्रजेत् । क्षारादीना मृतञ्चेह शीततां याति निर्भरम् ।।

(R. T. 18/45)

The 'vaṅga bhasma' prepared with 'gandhaka', 'haratāla' and such other 'uṣṇa' dravya, possesses 'uṣṇa guṇa'. On the other hand, the 'vaṅga bhasma' prepared with 'apāmārga kṣāra', 'ciñcākṣāra' and such other 'śīta' dravya, possesses 'śīta guṇa'. As per the therapeutic need, the bhasma is prepared and used.

**Vaṅga bhasma- colour:**

शङ्खकुन्देन्दुधवलं वङ्गभस्मं भवेद् ध्रुवम् । (R. T. 18/24)
वङ्ग शुभ्रत्वमायाति ........। (Yogaratnākara)

Properly incinerated 'vaṅga bhasma' possesses 'bright white colour' (like that of śaṅkha).

**Vaṅga bhasma- properties:**

वङ्गं मृतं लघु सरं शिशिरञ्च रूक्षं मेघ्यं सतिक्ततुवरं लवणञ्च किञ्चित् ।
मेदोहरं रुचिकरञ्च रसायनञ्च श्लेष्मामयप्रशमनं खलु संप्रदिष्टम् ।।
वङ्गं वान्तिहरं परं व्रणहरं सर्वप्रमेहापहं चक्षुष्यं सुमतिप्रदं क्षयहरं शुक्रैकसवर्द्धनम् ।
श्वेतासृग्दरनाशनं व्रणहरं जन्त्वामयध्वंसनम् कामं कामविवर्धनं धृतिकरं वर्ण्यं निकामं तथा ।।
वङ्गं कामं मदनजननं स्वप्नमेहामयघ्नं कासश्वासप्रशमनपटु प्रीणनं कार्श्यभाजाम् ।
वृष्यं बल्यं पवनशमनं पाण्डुहृच्चातिवेलं वाग्जालैः किं भवति नितरां सौख्यप्रदं देहभाजाम् ।।
गर्भाशयच्युततिहरं श्वासकृच्छ्रप्रणाशनम् । शोफोद्भूतनिशास्वेदोल्वणश्लेष्महरं परम् ।।

(R. T. 18/39-42)

The properly prepared 'vaṅga bhasma' possesses laghu, śīta, rūkṣa guṇa. Its judicious use for internal administration promotes the intellect (medya). It has tikta, kaṣāya (tuvara) and alpa lavaṇa rasa. It eradicates excessive fat (meda) and is a good appetizer. It is a good rejuvenator and cures kaphaja roga.

It is effective against chardi roga (vomiting), vraṇa (wounds) and all types of prameha (diabetes). It is good to eyes (cakṣuṣya), keeps the mind stable, cures kṣaya roga and improves the sperm output.

It cures śweta pradara (leūcorrhoea) and rakta pradara, cures all types of wounds, kills all types of intestinal worms. It improves the sexual desire and virility. It makes the person valorous and improves his body radiance.

It prevents 'swapna skhalana' (discharge of semen in sleep); cures śwāsa and kāsa; provides good nourishment and cures 'kārśyatwa'. It is aphrodisiac and improves physical strength. It mitigates the vitiated vāta doṣa and cures pāṇḍu roga (anaemia).

What more to say about the properties of 'vaṅga bhasma', it is a wonderful medicine for all the ailments of a person. Its use corrects 'garbha-cyuti' (displaced uterus) and it cures difficulty in breathing. It is the best medicine to cure night sweating and vitiated kapha doṣa in 'rājayakṣma roga'.

**Vaṅga bhasma- special properties:**

मृतन्तु वङ्गं परिशीलितन्तु विनाशयेन्नातिचिरेण नूनम् ।
चिरोत्थितं श्वासनलीविलग्नं कफं प्रवृद्धं मलनामधेयम् ।।
मृतन्तु वङ्गं परिशीलितं वै निवारयेन्नतिचिरेण कामम् ।
सर्वाङ्गगं मानसवैकृतोत्थं प्रसादसंज्ञं पवनं प्रवृद्धम् ।। (R. T. 18/43-44)

The judicious administration of properly prepared 'vaṅga bhasma' removes the kapha doṣa adhered to the walls of respiratory tract. It also effectively mitigates the vitiated vāta doṣa in mental ailments.

**Vaṅga bhasma- dosage:**

रक्तिकातः समारभ्य रक्तिद्वितयसंमिताम् । पूर्णमात्रां प्रयुञ्जीत मृतवङ्गस्य कोविदः ।।
(R. T. 18/46)

One rattī (125 mgs) to two rattī (250 mgs) is the general dosage of 'vaṅga bhasma'. However, the dosage is finalized after thorough consideration of all the relevant factors that affect the dosage.

Adjuvant: Vaṅga bhasma may be administered along with honey, ghee, milk, butter or any other suitable adjuvant (swarasa or kwātha) depending on the disease condition.

### Vaṅga bhasma- toxicity and antidote:

मेषश्रृङ्गीसितायुक्तां यः सेवेत दिनत्रयम् । वङ्गदोषविमुक्तोऽसौ सुखं जीवति मानवः ।।

(Bṛ. R. Rā. Su.)

In case of any toxicity because of 'vaṅga bhasma' administration, the patient should be advised to take 'meśaśṛṅgī cūrṇa' + 'sugar' for 3 consecutive days (or more) to nullify the same.

### Vaṅga bhasma- compound formulations:

1. Swarṇa vaṅga
2. Trivaṅga bhasma
3. Lakṣmīvilāsa rasa
4. Vaṅgāṣṭaka rasa
5. Nityānanda rasa
6. Tālakeśwara rasa
7. Indu vaṭī
8. Kṣayakesarī rasa

## SWARṆA VAṄGA

### Swarṇavaṅga- 1st method of preparation:

कर्षत्रयमितं वङ्गं दर्व्यां न्यस्यानले न्यसेत् । विद्रुते तत्समं सूतं द्रुतं तत्र विनिक्षिपेत् ।
द्रुतं निक्षिप्य खल्वे च पेषयेदतियत्नतः । अम्लेन केनचिद्वापि सह सम्मर्दयेत्ततः ।।
विमर्द्य सैन्धवं दत्त्वा बहुशः क्षालयेत्ततः । विशुद्धं गन्धकञ्चाथ दद्यादीश्वरसंमितम् ।।
चुल्लिकालवणञ्चैव बलितुल्यं विनिक्षिपेत् । सम्पेष्य चातियत्नेन श्लक्ष्णचूर्णन्तु कारयेत् ।।
सवस्त्रमृत्तिकालिप्तकाचकुप्यां ततो न्यसेत् । यत्नतः सिकतायन्त्रे चतुर्यामं पचेत्ततः ।।
निर्धूमे जायमाने च काचकूपीमुखे भिषक् । संदंशेन गृहीत्वा च कूपीं भूमौ तु विन्यसेत् ।।
काचकूपीं विभिद्याथ कूपिकातलसंस्थितम् । स्वर्णवर्णं स्वर्णवङ्गं भिषग्रत्नः समाहरेत् ।।
कूपीभेदनकाले तु सूक्ष्मदर्शी भिषग्वरः । सूक्ष्मान् काचकणान् सम्यङ् निरीक्ष्य परिवर्जयेत् ।।
वङ्गं सञ्जायते यस्मात् कीर्णं स्वर्णकणैरिव । तस्माद्रसायनाचार्यैः स्वर्णवङ्गं प्रकीर्तितम् ।।

(R. T. 18/68-76)

1. Śuddha vaṅga 2. Śuddha pārada 3. Śuddha gandhaka 4. Śuddha navasādara; all these drugs are taken 1 part (3 karṣa = 36 gms each);

One part of śuddha vaṅga is taken in a clean loha darvī and heated to liquify it completely. Molten vaṅga is soon poured into the khalva yantra, which contains one part of 'śuddha pārada'. Soon the mixture is triturated rigorously for about 30 minutes to obtain the drug mixture in powder form.

This powder is added with required quantity of any of the 'amla dravya' (nimbū rasa) for a while. Later it is added with quarter part of 'saindhava lavaṇa' and triturated thoroughly. Later the mixture is repeatedly washed with water to remove all the salt in the mixture.

The drug powder is dried under hot sun, taken back in khalva yantra and added with one part of 'śuddha gandhaka'. The mixture is triturated again for

2 to 3 days to obtain appropriate kajjalī. Later it is added with one part of 'navasādara' and triturated to obtain a homogenous mixture.

This drug mixture is carefully filled into 'mṛt-vastralepita kācakūpī' (bottle prepared with 7 layers of mud and cloth for kūpī-pāka). The bottle is firmly placed in vālukā yantra and subjected to mṛdu agni for 4 yāma (12 hrs).

Next day when cool on its own, the bottle is taken out from vālukā yantra and carefully wrecked as per procedure. The golden coloured compound at the base of the bottle is collected and preserved in an airtight glass container as 'swarṇavaṅga'.

Note: To attain bright golden colour in the compound, one should add quarter part of 'sūryakṣāra'.

### Swarṇavaṅga- 2nd method of preparation:

वंगं सूर्यमितं द्रुतं रसमितं सूतञ्च सम्पेषयेत् प्रक्षाल्याम्लरसैः क्षिपेद् वुधवरो नागोन्मितं गन्धकम् ।
वङ्गांशं नवसादरञ्च विमलं संपेष्य यत्नात्पचेत् कूपीस्थं सिकताख्ययन्त्रविधिना कूपीं ततस्त्वाहरेत् ।।
कूपीं विभिद्य यत्नेन रसतन्त्रविचक्षणः । स्वर्णरम्यं स्वर्णवर्णं स्वर्णवङ्गं समाहरेत् ।।
आयुर्वेदमहाम्भोधिकर्णधारधुरन्धरैः । मित्रवंशावतंसैस्तु गुरुवर्यमहोदयैः ।।
श्रीमन्नरेन्द्रनाथाख्यैस्त्वयमाविष्कृतो विधिः । प्रकाशितः खलु मया लोकानुग्रहकाम्यया ।।

(R. T. 18/77-80)

1. Śuddha vaṅga- 12 parts; 2. Śuddha pārada- 6 parts; 3. Śuddha gandhaka- 8 parts; and 4. Śuddha navasādara- 6 parts; all these drugs are taken in specified ratios.

Mentioned ratio of śuddha vaṅga is taken in a clean loha darvī and heated to liquify it completely. Molten vaṅga is soon poured into the khalva yantra, which contains mentioned quantity of pārada. Soon the mixture is triturated rigorously for about 30 minutes to obtain the drug mixture in powder form.

This powder is added with required quantity of any of the 'amla dravya' (nimbū rasa) for a while. Later it is added with quarter part of 'saindhava lavaṇa' and triturated thoroughly. Later the mixture is repeatedly washed with water to remove all the salt in the mixture.

The drug powder is dried under hot sun, taken back in khalva yantra and added with mentioned quantity of 'śuddha gandhaka'. The mixture is triturated again for 2 to 3 days to obtain appropriate kajjalī. Later it is added with specified quantity of 'navasādara' and triturated to obtain a homogenous mixture.

This drug mixture is carefully filled into 'mṛt-vastralepita kācakūpī' (bottle prepared with 7 layers of mud and cloth for kūpī-pāka), firmly placed in vālukā yantra and subjected to mṛdu agni for 4 yāma (12 hrs).

All the remaining procedure is same as explained above in first method of 'swarṇavaṅga' preparation. The golden coloured compound formed at the base of the bottle is collected and preserved in an airtight glass container as 'swarṇavaṅga'.

**Swarṇavaṅga- properties:**

> सुवर्णवङ्गं शिशिरञ्च रूक्षं सरं सतिक्तं लवणञ्च साम्लम् ।
> रसायनं मेहहरञ्च मेध्यं वल्यञ्च नेत्र्यं परमं प्रदीष्टम् ।।
> लावण्यदं वह्निविवर्द्धनञ्च श्लेष्मामयघ्नं परमञ्च वृष्यम् ।
> मेदोहरं शुक्रकरं निकामं सुवर्णवङ्गं कथितं रसज्ञैः ।। (R. T. 18/81-82)

Swarṇavaṅga possesses śīta vīrya; śīta, rūkṣa and sara guṇa; and tikta, lavaṇa and amla rasa. It is a good rejuvenator when used judiciously for internal administration. It is helpful in prameha roga (diabetes). It is a good intellect promoter, provides good physical strength and is useful in all types of eye diseases.

Its regular use enhances the body radiance, improves the appetite and mitigates vitiated kapha doṣa. It is the best aphrodisiac, brings down the excessive fat in the body (medohara) and normalizes the production of healthy sperm.

**Swarṇavaṅga- dosage:**

> गुञ्जैकतः समारभ्य गुञ्जां द्वितयसंमितम् । सुवर्णवङ्गं युञ्जीत बलकालाद्यपेक्षया ।। (R. T. 18/83)

One rattī (125 mgs) to two rattī (250 mgs) is the general dosage of 'vaṅga bhasma'. However, the dosage is finalized after thorough consideration of all the relevant factors that affect the dosage.

Adjuvant: Water, honey, cūrṇa, swarasa, kwātha of different medicinal drugs can be used as adjuvant depending the disease condition.

## 3. YAŚADA

(Zinc)

**Yaśada (Zinc)- general information:**

Yaśada (Zinc) is a metallic chemical element; it has the symbol **Zn** (Latin-Zincum) and atomic number 30. Zinc is the 24th most abundant element in the Earth's crust.

**Physical properties:**

Zinc, also referred to in non scientific contexts as *spelter*, is a bluish-white, lustrous, diamagnetic metal, though most common commercial grades of the metal have a dull finish. It is somewhat less dense than iron and has a hexagonal crystal structure.

The metal is hard and brittle at most temperatures but becomes malleable between 100 and 150$^0$ C. Above 210$^0$C, the metal becomes brittle again and can be pulverized by beating. Zinc is a fair conductor of electricity. For a metal, zinc has relatively low melting 419.5$^0$C (787.1 F) and boiling points (907$^0$ C). Its melting point is the lowest of all the transition metals aside from mercury and cadmium.

**Zinc alloys:**

Many alloys contain zinc, including brass, an alloy of zinc and copper. Other metals long known to form binary alloys with zinc are aluminium, antimony, bismuth, gold, iron, lead, mercury, silver, tin, magnesium, cobalt, nickel, tellurium and sodium.

**Medicinal use:**

Zinc is an essential mineral of "exceptional biologic and public health importance". Zinc deficiency affects about two billion people in the developing world and is associated with many diseases. In children it causes growth retardation, delayed sexual maturation, infection susceptibility, and diarrhoea, contributing to the death of about 800,000 children worldwide per year.

Enzymes with a zinc atom in the reactive centre are widespread in biochemistry, such as alcohol dehydrogenase in humans. Consumption of excess zinc can cause ataxia, lethargy and copper deficiency.

**Physical properties:**

| | |
|---|---|
| Latin name | Zincum (Zinc) |
| Symbol | Zn |
| Atomic number | 30 |
| Specific gravity | 7.1 |
| Melting point | 419.5$^0$ C |
| Boiling point | 907$^0$ C |
| Conductivity | Good conductor of heat and electricity |
| Malleability and ductility | Good |
| Atmospheric exposure | Unaffected by dry air but tarnished in moist air |
| Solubility | Soluble in dilute acids |
| Heat exposure | Burns with greenish-white flames |

**Yaśada (Zinc)- brief history:**

Yaśada has a long history as 'kharpara sattva'. Its references (as kharpara sattva) can be traced from 'Rasārṇava', a book of 10th century. It is also identified as 'rītikṛta' and 'tāmra rañjaka' in many ancient rasa texts.

During the rule of 'Muslim dynasties', it was renamed as 'yaśada' under the influence of Arabic term 'jastā'. Madanapāla Nighaṇṭu a book of 15th century was the first one to mention the name 'yaśada'.

Āḍhamalla, the commentator of 'Śārṅgadhara Saṁhitā' categorized this drug under dhātu varga. Author of the book 'Āyurveda Prakāśa' has dealt with this drug in detail for the first time. In recent times, the metal is extensively studied for its toxic effects, described and used as medicine.

**Zinc- ores:**

The most common zinc ore are;

1. Sphalerite (zinc blende) (Zinc sulphide; $ZnS$)
2. Zincite (Zinc oxide; $ZnO$)
3. Calamine (Zinc carbonate; $ZnCO_3$)
4. Hemimorphite (Zinc silicate)

**Zinc- occurrence:**

The largest mineable amounts are found in Australia and the United States. In India, it is found in Bihar, Rajasthan, Punjab, Kashmir, Madya Pradesh and Tamil Nadu.

**Yaśada (zinc)- synonyms:**

यशदं यसदञ्चैव जशदं जसदं तथा । रीतिहेतुः खर्परजं समाख्यातं भिषग्वरैः ॥ (R. T. 19/94)
यशदं रङ्गसङ्काशं रीतिहेतुश्च तन्मतम् ॥ (Āy. Pra. 3/181)

Yaśada, yasada, jaśada, jasada, rītihetu, kharparaja and raṅgasaṅkāśa; all these are the synonymous words used for 'yaśada' (zinc) in the classics.

**Yaśada- grāhya swarūpa:**

छेदे समुज्ज्वलं स्निग्धं मृदुलं निर्मलं तथा । द्रुतद्रावं महाभारं यशदं ग्राह्यमुच्यते ॥ (R. T. 19/95)

The 'zinc' which exhibits shiny interior surface when cut, which is snigdha, mṛdu (soft) and clean; which melts abruptly soon after reaching the melting point; and which is heavy; such a sample of 'zinc' is selected as 'grāhya yaśada'.

**Yaśada- agrāhya swarūpa:**

कठिनं कठिनद्रावं रूक्षं रूक्षप्रभं लघु । मलिनं यशदं यत्तु तद्ग्राह्यं प्रकीर्तितम् ॥ (R. T. 19/96)

The sample of 'zinc', which is hard, which melts with difficulty, which is rough (rūkṣya) with dull lustre; which is light in weight and which is unclean; such a sample of 'zinc', is considered as 'agrāhya yaśada' and is not selected for therapeutic purposes.

**Yaśada śodhana- necessity:**

> विशुद्धिहीनं यशदं मृतञ्चेद् विशोधितं वाप्यमृतं त्वविज्ञैः ।
> निषेवितं वै जनयेद् विकारान् गुल्मप्रमेह क्षयकुष्ठकादीन् ।। (R. T. 19/97)

Consumption of impure or improperly purified 'yaśada' in any form will cause 'gulma roga', 'prameha roga', 'kṣaya roga' and 'kuṣṭha roga'. another supporting reference for this fact is as below;

> अपक्वं यशदं रोगान् प्रमेहजीर्णमारुतान् । वमिं भ्रमं करोत्येतच्छोधयेत्रागवत्ततः ।। (Bṛ. R. Rā. Su.)

## YAŚADA ŚODHANA

In relation with the purification and incineration of 'yaśada', author of 'Āyurveda Prakāśa' mentions that the 'śodhana' and 'māraṇa' of 'yaśada' is same as that of 'vaṅga' (tin).

> यशदं गिरिजं तस्य दोषाः शोधनमारणे । वङ्गस्येव हि बोधव्यः गुणास्तु प्रवदाम्यहम् ।।
> (Āy. Pra. 3/98-99)

However, the detailed methods of 'yaśada śodhana and māraṇa' are provided below as per the references of 'Rasataraṅgiṇī';

**Yaśada śodhana- 1st method:**

> जात्यं यशदमादाय लोहदर्व्यान्तु विन्यसेत् । तीव्राग्निना तु विद्राव्य चूर्णवारिप्रपूरिते ।।
> सच्छिद्रेण पिधानेन पिहितास्ये घटे क्षिपेत् । सप्तवारं प्रयत्नेन यशदं शुद्धिमाप्नुयात् ।।
> (R. T. 19/98-99)

The 'aśuddha yaśada' (zinc) is taken in a clean bigger sized iron tablespoon. It is held over fire and heated. When it completely melts, the molten 'zinc' is poured through 'pidhānaka yantra' into a vessel containing 'cūrṇodaka' (limewater). The solidified 'zinc' is collected back, melted again and poured in fresh limewater.

Like this, the process of melting and pouring in fresh limewater is repeated for 7 times to obtain the 'zinc' purified. With each pouring, the 'zinc' becomes brighter in appearance. Later it is dried and stored as 'śuddha yaśada' for further pharmaceutical use.

Note: Pidhānaka yantra is a closure placed over the vessel with a small opening in the middle. It can be a mud 'śarāva', a wooden or a metallic flank with a hole in the middle to pour the molten metal. If the molten metal is poured in the liquid of an open vessel, the metal jumps off the vessel and can be hazardous.

**Yaśada śodhana- 2$^{nd}$ method:**

> यशदं द्रावितं यत्नात् सप्तवारं विधानतः । सिन्दुवारशिफाद्रावे स्नपयेद्भिषजां वरः ।।
> रीत्यानया तु यशदं शुद्धिमायात्यनुत्तमाम् । एवं शुद्धन्तु यशदं मारणाय प्रयोजयेत् ।।
>
> (R. T. 19/100-101)

The 'aśuddha yaśada' (zinc) is taken in a clean bigger sized iron tablespoon. It is held over fire and heated. When it completely melts, the molten 'zinc' is poured through 'pidhānaka yantra' into a vessel containing 'nirguṇḍī-mūla swarasa'. The solidified 'zinc' is collected back, melted again and poured in fresh 'nirguṇḍī-mūla swarasa'.

Like this, the process of melting and pouring in fresh 'nirguṇḍī-mūla swarasa' is repeated for 7 times to obtain the 'zinc' purified. With each pouring, the 'zinc' becomes brighter in appearance. Later it is dried and stored as 'śuddha yaśada' for further pharmaceutical use.

**Yaśada śodhana- 3$^{rd}$ method:**

> यशदं द्रावितं यत्नाद् गोदुग्घे स्नपयेद्भिषक् । त्रिसप्तवारं यत्नेन यशदं शुद्धिमाप्नुयात् ।।
>
> (R. T. 19/102)

The 'aśuddha yaśada' (zinc) is taken in a clean bigger sized iron tablespoon. It is held over fire and heated. When it completely melts, the molten 'zinc' is poured through 'pidhānaka yantra' into a vessel containing 'cow's milk'. The solidified 'zinc' is collected back, melted again and poured in fresh 'cow's milk'.

Like this, the process of melting and pouring in fresh 'cow's milk' is repeated for 21 times to obtain the 'zinc' purified. With each pouring, the 'zinc' becomes brighter in appearance. Later it is dried and stored as 'śuddha yaśada' for further pharmaceutical use.

**Yaśada śodhana- 4$^{th}$ method:**

> प्रद्राव्य यशदं वैद्यः सुधादुग्धे निषेचयेत् । सप्तवारं प्रयत्नेन शुद्धिमायात्यनुत्तमाम् ।।
>
> (R. T. 19/103)

The 'aśuddha yaśada' (zinc) is taken in a clean bigger sized iron tablespoon. It is held over fire and heated. When it completely melts, the molten 'zinc' is poured through 'pidhānaka yantra' into a vessel containing 'snuhī kṣīra'. The solidified 'zinc' is collected back, melted again and poured in fresh 'snuhī kṣīra'.

Like this, the process of melting and pouring in fresh 'snuhī kṣīra' is repeated for 21 times to obtain the 'zinc' purified. With each pouring, the 'zinc' becomes brighter in appearance. Later it is dried and stored as 'śuddha yaśada' for further pharmaceutical use.

**Yaśada māraṇa- 1st method:**

शुद्धं यशदमादाय कटाहे तीव्रवह्निना । प्रद्राव्य भिषजां वर्यः समपारदगर्भके ।।
खल्वे विनिक्षिपेद्यत्नात्ततः सम्पेषयेद् द्रुतम् । पिष्टिं विधाय यत्नेन क्षालयेन्निम्बुवारिणा ।।
यशदप्रमितं गन्धं दत्त्वा सञ्चूर्णयेत्ततः । शरावसंपुटस्थन्तु पुटयेदथ यत्नतः ।।
रीत्यानया तु यशदं मृतिमायात्यनुत्तमाम् । इत्थं मृतन्तु यशदं सर्वयोगेषु योजयेत् ।।

(R. T. 19/104-107)

One part of 'śuddha yaśada' is taken in a clean iron vessel (kaḍhāhī) and heated to liquify it completely. Molten vaṅga is soon poured into the khalva yantra, which contains one part of 'śuddha pārada'. Soon the mixture is triturated rigorously to obtain the drug mixture in the form of amalgam.

This amalgam is added with required quantity of 'nimbū rasa' and triturated thoroughly and later washed with water. Now it is added with one part of 'śuddha gandhaka' and triturated thoroughly to obtain the drug mixture in blackish powder form.

This powder is enclosed in 'śarāva sampuṭa' and subjected for one puṭa (laghu puṭa). When cool on its own, the drug material inside the 'śarāva' is collected, triturated and stored as 'yaśada bhasma'.

**Yaśada māraṇa- 2nd method:**

यशद विशुद्धमादौ विनिधाय वै कटाहे । अतितीव्रवह्नियोगात् खलु गालयेन्निकामम् ।।
दृढनिम्बदण्डदर्व्या परिचालयेत्प्रयत्नात् । सुमृतं ततो विलोक्य त्ववतारयेत्कटाहम् ।।
विमलं प्रदाय तालं चरणांशिकं रसज्ञः । खलु पेषयेत्प्रयत्नात् पुटवित् पुटेत् पुटस्थम् ।।
रीत्यानया तु यशदं मृतिमेति निर्विशेषाम् । विविधानुपानयोगात् वितरेत्तु वीतशङ्कः ।।

(R. T. 19/108-111)

In a wide mouthed iron vessel (kaḍhāhī), one part of 'śuddha yaśada' is taken and the vessel is placed over intense fire. When the 'zinc' melts completely, the process of heating is continued by rubbing with a strong shaft of 'neem tree' until all the 'zinc' attains powder form.

This 'zinc powder' is taken in a clean khalva yantra and added with quarter part of 'śuddha haratāla cūrṇa' and triturated thoroughly. This homogenous mixture is enclosed in 'śarāva sampuṭa' and subjected for 'puṭa' (laghu puṭa). When cool on its own, the drug material inside 'śarāva' is collected, triturated and stored in suitable airtight container as 'yaśada bhasma'. It can be used for internal administration with different adjuvant without any inhibitions.

**Yaśada māraṇa- 3rd method:**

> यशदं विमलं न्यस्यं कटाहे गालयेद्भिषक् । अपामार्गस्य चूर्णञ्च स्वल्पं स्वल्पं मुहुर्मुहुः ।।
> विनिक्षिपेत् भिषग्वर्यो लोहदर्व्याथ चालयेत् । भस्म यावद् भवेत्सम्यक् चूर्णं तावत् समापयेत् ।।
> राशीकृत्य ततो भस्म शरावेण पिधापयेत् । ज्वलदङ्गारवर्णं स्याद्यशदं तु यथा चिरम् ।।
> तथा प्रदीपयेदग्निं दिनमेकं भिषक्तमः । स्वतः शीतं ततो ज्ञात्वा यशदं मृतमाहरेत् ।।

(R. T. 19/112-115)

In a wide mouthed iron vessel (kaḍhāhī), one part of 'śuddha yaśada' is taken and the vessel is placed over intense fire. When the 'zinc' melts completely, it is added little by little with quarter part of 'apāmārga cūrṇa' and rubbed thoroughly with the base of a bigger iron spoon. This process is continued until all the 'apāmārga cūrṇa' is added.

By this time, the 'zinc' attains 'bhasma' form. It is now heaped up in the middle of the vessel, closed with an inverted mud lid (mṛt-śarāva) and subjected further to intense heat for a day.

The mud lid is lifted to find whether the molten 'vaṅga bhasma' in the vessel appear reddish like fire. If so, the fire is stopped and allowed to cool on its own. Later the drug material inside is collected, triturated and stored in suitable airtight container as 'yaśada bhasma'.

Note: Though not mentioned, the 'bhasma' prepared with any of the 'kṣārayukta dravya' (apāmārga, aświattha etc), the bhasma has to be made 'alkaline free' to make it fit for internal administration (as per the method given below).

**Bhasmas and the alkalinity test:**

To remove the alkalinity from any of the bhasmas prepared with any of the 'kṣārayukta dravya' (apāmārga, aświattha, ciñcā etc), and make it fit for internal administration, the bhasma is repeatedly washed with water.

To confirm the absence of alkalinity in 'bhasma', the washed water is tested each time by dipping a 'red litmus paper'. If the paper turns bluish in colour, it indicates the presence of alkalinity. If no, the bhasma is declared 'alkaline free' and stored in suitable airtight containers for further therapeutic use.

### Yaśada māraṇa- 4th method:

कटाहसंस्थं यशदं विमलन्तु शनैः शनैः । विघट्टयेल्लोहदर्व्या पचेत्तीव्राग्निना भिषक् ।।
यशदं चूर्णतां यातं वस्त्रपूतन्तु कारयेत् । स्थूलांशञ्च पुनः कामं कटाहस्थं विपाचयेत् ।।
एवं नातिचिरादेव यशदं मृतिमाप्नुयात् । कुन्देन्दुधवलं भस्म जायते चातिशोभनम् ।।
रीत्यानया खलु मृतं यशदन्तु विधानतः । नावनाञ्जनकार्यादौ योजयेद्भिषजां वरः ।।

(R. T. 19/116-119)

In a wide mouthed iron vessel (kaḍhāhī), required quantity of 'śuddha yaśada' is taken and the vessel is placed over intense fire. When the 'zinc' melts completely, it is stirred rigorously with 'loha darvī' and the heating process is continued until all the zinc attains powder form.

This powder is allowed to cool down on its own and later filtered through a clean cotton cloth or through a sieve of appropriate size. If any rough powder remains, it is again taken in 'kaḍhāhī', placed over intense heat and all the process is prepared to obtain it in the form of fine powder. It is again filtered and added with earlier filtrate.

Like this, the complete 'zinc' is processed and the filtrate obtained is collected and stored as 'yaśada bhasma'. It will be soft, whitish bhasma, which can be used for 'nasya', 'añjana' and for other external use.

Note: Without subjecting the drug to appropriate 'puṭa', obtaining proper 'yaśada bhasma' is difficult. The bhasma prepared with above method may remain as an 'incomplete bhasma' and may be considered only for external use. However, for internal use one needs to rethink on this method.

### Yaśada bhasma- colour:

Appropriately prepared 'yaśada bhasma' should have 'pale white' or 'white' colour. In classics the terms used as 'candra varṇa', 'kandapuṣpa varṇa' and 'śweta varṇa'.

### Yaśada bhasma- dosage:

गुञ्जार्द्धतः समारभ्य गुञ्जैकप्रमितं मृतम् । यशदं विनियुञ्जीत बलकालाद्यपेक्षया ।। (R. T. 19/125)

Half rattī (62 mgs) to one rattī (125 mgs) is the general dosage of 'yaśada bhasma'. However, the dosage is finalized after thorough consideration of all the relevant factors that affect the dosage.

### Yaśada bhasma- properties and indication:

यशदं तुवरं शिशिरं कटुकं  परमं नयनामयनाशकरम् ।
कफपित्तसमुत्थितरोगहरं बलवीर्यविवेकसमुद्धिकरम् ।।

यशदं पाण्डुशमनं बहुमेहनिषूदनम् । कासश्वासप्रशमनं निशास्वेदनिबर्हणम् ॥
यशदं परमं श्लेष्मकलासंकोचकृन्मतम् । समाख्यातं विशेषेण व्रणसंस्रावरोधनम् ॥
श्रमावसादशमनं रजः स्रावनिषूदनम् । कम्पवातापहं चैव विशेषात्परिकीर्तितम् ॥

(R. T. 19/120-123)

Properly prepared 'yaśada bhasma' possesses 'kaṣāya' and 'kaṭu' rasa; and 'śīta' guṇa. When used externally, it cures many types of 'netra roga'. Its judicious internal use cures, kapha-pittaja roga. It improves the physical strength, virility and intellect.

It is also useful in pāṇḍuroga, excessive urination (prameha), kāsa, śwāsa, rājayakṣma and jīrṇajwara associated with 'rātri sweda'. It is a good 'śleṣma kalā-saṅkocaka' and it prevents the excessive secretions from the wounds and heal them. Its use relieves the tiredness and regulates the excessive menstrual flow. It effectively cures the 'kampavāta' roga.

**Yaśada bhasma- special properties:**

संशीलितं वै यशदं मृतन्तु विनाशयेदाशु भृशं विशेषात् ।
प्रसादसंज्ञं पवनं प्रवृद्धमेकाङ्गगं वै सकलाङ्गगं वा ॥ (R. T. 19/124)

Yaśada bhasma is an effective medicine in mitigating the vitiated 'vāta doṣa'. It mitigates both 'ekāṅga vāta' and 'sarvāṅga vāta'. Therefore, this bhasma can be indicated in all types of vātaja roga.

**Yaśada bhasma- toxicity and antidote:**

बलाभया सितायुक्तां सेवते यो दिनत्रयम् । यशदस्य विकारस्तु शान्तिमायाति नान्यथा ॥

(Bṛ. R. Rā. Su.)

In case of toxic effects due to administration of 'yaśada bhasma', the person should be administered with; Balā mūla cūrṇa + Harītakī cūrṇa + Sugar; for three (or more) consecutive days as antidote.

**Yaśada bhasma- compound formulations:**

1. Yaśadāmṛta malahara
2. Trivaṅga bhasma
3. Śilājatwādi vaṭī
4. Laghuvasantamālatī rasa
5. Suvarṇavasantamālatī rasa

## 1. PITTALA

(Brass)

**Pittala (brass)- general information:**

**Brass** is an alloy of 'copper' and 'zinc'; the proportions of zinc and copper can be varied to create a range of brasses with varying properties. By comparison, bronze is principally an alloy of copper and tin. Bronze does not necessarily contain tin, and a variety of alloys of copper, including alloys with arsenic, phosphorus, aluminium, manganese, and silicon, are commonly termed "bronze". The term is applied to a variety of brasses and the distinction is largely historical.

Brass has higher malleability than bronze or zinc. The relatively low melting point of brass 900 to 940$^0$ C (1652 to 1724$^0$ F), (depending on composition) and its flow characteristics make it a relatively easy material to cast. By varying the proportions of copper and zinc, the properties of the brass can be changed, allowing hard and soft brasses.

**Germicidal action:**

The copper in brass makes brass germicidal. Depending upon the type and concentration of pathogens and the medium they are in, brass kills these microorganisms within a few minutes to eight hours of contact.

The bactericidal properties of brass have been observed for centuries and were confirmed in the laboratory in 1983. Subsequent experiments by research groups around the world reconfirmed the antimicrobial efficacy of brass, as well as copper and other copper alloys (see antimicrobial copper-alloy touch surfaces). Extensive structural membrane damage to bacteria was noted after being exposed to copper.

**Pittala (brass)- brief history:**

Pittala (brass) is an alloy of tāmra (copper) and yaśada (zinc). The references of these to alloy metals hold good as references for pittala. Its use for medicinal purposes is seen from 'Saṁhitā kāla'.

At many places of 'Caraka Saṁhitā' and consecutive grantha, we find the references of 'pittala'. With the evolution of 'Rasaśāstra', this alloy metal was extensively studied for its toxic effects, described and used as medicine.

**Pittala (brass)- synonyms:**

पित्तलं पीतलोहञ्च कपिलोहञ्च रीतिका । आरं तथारकूटञ्च तदेव परिकीर्तितम् ॥ (R. T. 22/1)

Pittala, pītaloha, kapiloha, rītikā, āra and ārakūṭa; all these are the synonymous words used in classics for 'pittala' (Brass).

**Pittala- method of preparation:**

द्विभागिकं सूर्यलोहं विधिना परिशोधितम् । भागैकिकं च यशदं विमलं तु समाहरेत् ॥
निधाय गारमूषायां प्रधमेत् प्रखराग्निना । द्रवीभूतं ततो ज्ञात्वा ढालयेद्रसकोविदः ॥

dr.keshav-raj

रीत्याऽनया विशेषेण पित्तलं खलु निर्मितम् । भस्मीकृत्य प्रयुञ्जीत रसेषु रसकर्मवित् ।।

(R. T. 22/2-4)

Pittala (brass) is the alloy of 'copper' and 'zinc'. Therefore, to prepared 'brass', two parts of 'śuddha tāmra' (copper) and one part of 'śuddha yaśada' (zinc) are taken together in a 'gāra mūṣā'.

This 'mūṣā' is placed in a 'koṣṭhī' and subjected for intense fire. When both these metals melt, the molten liquid metal mixture is poured into the moulds. When the metal solidifies, it is collected and stored as 'pittala' (brass). The 'pittala' prepared with this method can be used for incineration and for further therapeutic use.

**Pittala- grāhya swarūpa:**

प्रखरानलसंतप्तं काञ्जिके परिषेचितम् । ताम्रप्रभं भवेद्यत्तु जात्यं तत्पित्तलं मतम् ।। (R. T. 22/5)

The 'pittala' (brass) when heated red-hot and dipped in 'kāñjī, it appears like 'copper'. Such a sample of 'pittala' is considered fit for pharmaceutical as well as therapeutic use.

**Pittala- agrāhya swarūpa:**

तप्तं यत्पित्तलं वह्नौ निषिक्तं गृहवारिणि । लौहप्रभं भवेत्कामं तद्धेयमिह कीर्तितम् ।। (R. T. 22/6)

The sample of 'pittala' when heated red-hot and dipped in 'kāñjī, if it appears like that of 'black iron'. Such a sample of 'pittala' is considered unfit for pharmaceutical or therapeutic use.

**Pittala śodhana:**

तप्त्वा क्षिप्त्वा च निर्गुण्डी रसे श्यामारजोऽन्विते । पञ्चवारेण संशुद्धिं रीतिरायातिनिश्चितम् ।।

(R. R. S. 5/197)

The foils of 'pittala' (brass) are heated red-hot and dipped in a vessel containing 'nirguṇḍī swarasa added with haridrā cūrṇa'. This process of heating and dipping is repeated for seven times. Later the foils are dried and stored as 'śuddha pittala'. The same opinion is reiterated in the reference given below:

तनुपत्रीकृतं तप्तं रजनीरजसा युते । क्षिप्तं निर्गुण्डिकातोये पित्तलं शुद्धिमाप्नुयात् ।। (R. T. 22/9)

**Pittala (brass) māraṇa- 1st method:**

पत्रीकृतं पित्तलं तु समगन्धशिलान्वितम् । कन्यानीरेण संपिष्टं शोषितं संपुटे न्यसेत् ।।
त्रिवारं पुटयेदेवं भस्म स्यात्कज्जलप्रभम् । एवं मृतं पित्तलं तु वीतशङ्कः प्रयोजयेत् ।।

(R. T. 22/15-16)

The thin foils of 'śuddha pittala' (5 pala; 250 gms) are cut into small pieces and taken in a clean khalva yantra. It is added with equal quantities of 'śuddha gandhaka' and 'śuddha manaḥśilā'.

The mixture is thoroughly triturated by adding required quantity of 'ghṛtakumārī swarasa' and later dried under hot sun. The drug powder obtained is enclosed in 'śarāva samputa' and subjected to one 'gajapuṭa'.

This entire procedure is repeated for 3 times to obtain appropriately prepared blackish, smooth 'kajjalī' like bhasma of 'pittala', which is stored in suitable airtight containers for further pharmaceutical and therapeutic use.

**Pittala (brass) māraṇa- 2nd method:**

निम्बूरसशिलागन्धवेष्टिता पुटिताऽष्टधा ।
रीतिरायाति भस्मत्वं ततो योज्या यथायथम् । ताम्रवन्मारणं तस्याः कृत्वा सर्वत्र योजयेत् ।।
(R. R. S. 5/198-199)

The thin foils of 'śuddha pittala' (5 pala; 250 gms) are cut into small pieces and taken in a clean khalva yantra. It is added with equal quantities of 'śuddha gandhaka' and 'śuddha manaḥśilā'.

The mixture is thoroughly triturated by adding required quantity of 'nimbū swarasa' and later dried under hot sun. The drug powder obtained is enclosed in 'śarāva sampuṭa' and subjected to one 'gajapuṭa'.

This entire procedure is repeated for 8 times to obtain appropriately prepared blackish, smooth 'kajjalī' like bhasma of 'pittala', which is stored in suitable airtight containers for further pharmaceutical and therapeutic use.

Note: The last line of the verse quotes that, all the incineration procedures followed for 'tāmra māraṇa' hold good for 'pittala māraṇa' also.

**Pittala (brass) bhasma- utility and dosage:**

पित्तलस्य योगस्तु रविलोहसमो मतः । गुञ्जार्धतस्तु गुञ्जैकमिता मात्रा च युज्यते ।।(R. T. 22/18)

The therapeutic utility of 'pittala bhasma' is same as that of the 'tāmra bhasma' (raviloha bhasma) utility. Its dosage is half rattī (62 mgs) to one rattī (125 mgs).

**Pittala (brass) bhasma- properties:**

सुमृतं पित्तलं रूक्षं तिक्तं नातिविलेखनम् । कृमिघ्नं कुष्ठशमनं पाण्ड्वामयविनाशनम् ।।
(R. T. 22/17)

Appropriately prepared 'pittala bhasma' possesses 'tikta' rasa and does 'lekhana karma'. Its judicious internal use will cure 'intestinal worms', skin diseases (kuṣṭha roga), and pāṇḍu roga (anaemia).

**Pittala (brass) bhasma- compound formulations:**

| | |
|---|---|
| 1. Pittala rasāyana | 4. Meghanāda rasa |
| 2. Swarṇasindūra | 5. Ṣaḍānana rasa |
| 3. Ratnaprabhā vaṭī | 6. Ekādaśāyana rasa |

## 2. KĀṀSYA

(White copper; Bell metal; Bronze)

**Kāṁsya (bronze)- general information:**

**Bronze** is a metal alloy consisting primarily of 'copper' (tāmra), usually with 'tin' (vaṅga) as the main additive in the ratio of 8:2. It is hard and brittle, and it was particularly significant in antiquity, so much so that the 'Bronze Age' was named after the metal.

Bronze is considerably less brittle than iron. Typically, bronze only oxidizes superficially; once a copper oxide (eventually becoming copper carbonate) layer is formed, the underlying metal is protected from further corrosion. However, if copper chlorides are formed, a corrosion-mode called "bronze disease" will destroy it.

Copper-based alloys have lower melting points than steel or iron, and are more readily produced from their constituent metals. They are generally about 10 per cent heavier than steel, although alloys using aluminium or silicon may be slightly less dense.

Bronzes are softer and weaker than steel-bronze springs, for example, are less stiff (so store less energy) for the same bulk. Bronze resists corrosion (especially seawater corrosion) and metal fatigue more than steel and is a better conductor of heat and electricity than most steels. The melting point of bronze varies depending on the actual ratio of the alloy components and is about $950^0$ C. Bronze is nonmagnetic.

**Kāṁsya (bronze)- brief history:**

Kāṁsya (bronze) is an alloy of tāmra (copper) and vaṅga (tin). The references of these to alloy metals hold good as references for pittala. Its use for medicinal purposes is seen from 'Saṁhitā kāla'.

At many places of 'Caraka Saṁhitā' and consecutive grantha, we find the references of 'kāṁsya'. With the evolution of 'Rasaśāstra', this alloy metal was extensively studied for its toxic effects, described and used as medicine|

**Kāṁsya- synonyms:**

कंसीयं कांस्यक कांस्य घोषपुष्पञ्च घोषकम् । घोषो घोषं वह्निलोहं तदेव परिकीर्तितम् ।।
(R. T. 22/21)

Kaṁsīya, kāṁsyaka, kāṁsya, ghoṣapuṣpa, ghoṣaka, ghoṣo, ghoṣam and vahniloha; all these are the synonymous words used in the classics for 'kāṁsya'.

**Kāṁsya- method of preparation:**

रविलोहं वेदभागमितं विधिविशोधितम् । भागिकं विमलं वङ्गं गाढं मूषागतं धमेत् ।।
विद्रुतं जायते रम्यं वरघोषं तु कांस्यकम् । एवं विनिर्मितं कांस्यं मारणाय प्रयोजयेत् ।।
(R. T. 22/22-23)

Four parts of 'śuddha tāmra' (copper) and one part of 'śuddha vaṅga' (tin) are taken in a 'crucible' and heated over intense fire. When both the metals melt completely, the molten metal mixture is poured carefully into the moulds.

When this molten metal cools on its own and solidifies, it is collected and stored in suitable containers as 'kāṁsya' (bronze) for further pharmaceutical use.

**Kāṁsya- grāhya lakṣaṇa:**

सुनादं भास्वरं स्निग्धं श्वेतं मृदु च निर्मलम् । घनाग्निसहमत्यन्तं कांस्यं ग्राह्यमिहोच्यते ।।
(R. T. 22/24)

The 'kāṁsya', which produces resonant sound when struck on to a hard surface, which is shiny, snigdha, whitish coloured, soft to touch and which can withstand the heavy hammer strokes and the high intensity of heat; such a sample of 'kāṁsya' is considered fit for pharmaceutical use.

**Kāṁsya- agrāhya lakṣaṇa:**

निरुज्ज्वलं खरं रूक्षं पीतं दहनतापितम् । आताम्र मन्दनादञ्च कांस्यं हेयमुदीरितम् ।।
(R. T. 22/25)

The 'kāṁsya', which is lustreless, rough surfaced, dry, yellowish in colour, when heated attains the colour of copper and which produces dull sound when struck on to a hard surface; such a sample of 'kāṁsya' is considered unfit for pharmaceutical use.

**Kāṁsya śodhana- 1st method:**

तनुपत्रीकृतं कांस्यं वह्निसन्तापितं भृशम् । निर्वापितं गव्यमूत्रे सप्तधा शुद्धिमाप्नुयात् ।।
(R. T. 22/26)

तप्तं कांस्यं गवां मूत्रे वापितं परिशुद्ध्यति ।। (R. R. S. 5/209)

The foils of 'kāṁsya' (bronze) are heated red hot and dipped in a vessel containing 'gomūtra'. This process of heating and dipping is repeated for seven times. Later the foils are dried and stored as 'śuddha kāṁsya'.

**Kāṁsya śodhana- 2nd method:**

सूक्ष्मपत्रीकृतं घोषपुष्पाह्वयं मूत्रपट्वन्वितं स्थालिकायां न्यसेत् ।
यामसंपाचितं तीक्ष्णतीक्ष्णाग्निना सर्वदोषोज्झितं जायते सत्वरम् ॥ (R. T. 22/27)

The thin foils of pittala (brass) are taken in a clean vessel of suitable size. It is added with required quantity of 'gomūtra' along with 'saindhava lavaṇa' enough to drown these foils. Later the vessel is placed over fire and cooked for one prahara (3 hours).

When cool on its own, the foils are taken out, washed with water, dried under sun and stored as 'śuddha kāṁsya' in a suitable container for further pharmaceutical use. The 'kāṁsya' purified with this method will be free from all kinds of 'doṣas'.

**Kāṁsya māraṇa- 1st method:**

तनुपत्रीकृतं कांस्यं समगन्धसमन्वितम् । अर्कक्षीरेण सम्पेष्य शोषयेदातपे दृढम् ॥
सम्पुटस्थं ततः कृत्वा वारणाख्ये पुटे पुटेत् । एवं पुटत्रयात्कांस्यभस्म स्यात्सुमनोहरम् ॥
(R. T. 22/28-29)

The thin foils of 'śuddha kāṁsya' (1 part) are cut into small pieces and taken in a clean khalva yantra. It is added with equal quantitiy of 'śuddha gandhaka'.

The mixture is thoroughly triturated by adding required quantity of 'arka dugdha' and later dried under hot sun. The drug powder obtained is enclosed in 'śarāva sampuṭa' and subjected to one 'gajapuṭa' (vāraṇākhya puṭa).

This entire procedure is repeated for 3 times to obtain appropriately prepared bhasma of 'kāṁsya', which is stored in suitable airtight containers for further pharmaceutical and therapeutic use.

**Kāṁsya māraṇa- 2nd method:**

कांस्यं तुल्यं शिलागन्धयुतं कन्याम्बुपेषितम् । पुटेत् त्रिधैवं यत्नेन भस्म स्यात् कज्जलप्रभम् ॥
(R. T. 22/31)

The thin foils of 'śuddha kāṁsya' (1 part) are cut into small pieces and taken in a clean khalva yantra. It is added with equal quantities of 'śuddha manaḥśilā' and 'śuddha gandhaka'.

The mixture is thoroughly triturated by adding required quantity of 'ghṛtakumārī swarasa' and later dried under hot sun. The drug powder obtained is enclosed in 'śarāva sampuṭa' and subjected to one 'gajapuṭa'.

This entire procedure is repeated for 3 times to obtain appropriately prepared, blackish kajjalī like 'kāṁsya bhasma', which is later stored in suitable airtight containers for further pharmaceutical and therapeutic use.

**Kāṁsya bhasma- colour:**

Jet black colour like that of kajjalī is the colour of a properly prepared 'kāṁsya bhasma'.

**Kāṁsya bhasma- utility and dosage:**

> कांस्यकस्य प्रयोगस्तु रविलोहसमो मतः । गुञ्जार्द्धतश्च गुञ्जैकमिता मात्रा प्रयुज्यते ।। (R. T. 22/34)

The therapeutic usage of 'kāṁsya bhasma' is same as that of the 'tāmra bhasma' (raviloha bhasma) usage. Its dosage is half rattī (62 mgs) to one rattī (125 mgs).

Adjuvant: Honey or any other suitable adjuvant depending on disease condition.

**Kāṁsya bhasma- properties:**

> घोषपुष्पं तु तुवरं तिक्तोष्णं लेखने हितम् । नेत्रप्रसादनं रूक्षं सरं च विशदं परम् ।।
> कृमिघ्नं कुष्ठशमनं कफपित्तप्रणाशनम् । वातघ्नं दीपनञ्चैव परमेतत्प्रकीर्तितम् ।।
> (R. T. 22/32-33)

Appropriately prepared 'kāṁsya bhasma' possesses 'kaṣāya' and 'tikta' rasa'; 'uṣṇa' vīrya; 'lekhana' guṇa. It does 'netra prasādana'. It also possesses 'rūkṣya', 'sara' and 'viśada' guṇa.

Its judicious use cures 'udara kṛmi' (intestinal worms), 'kuṣṭha roga' (skin diseases). It mitigates vitiated kapha, pitta and vāta doṣa and is a good appetizer.

**Kāṁsya bhasma- compound formulations:**

1. Makaradhwaja rasa
2. Lakṣmīvilāsa rasa
3. Vātavidhvaṁsaka rasa
4. Nityānanda rasa
5. Kṣayakesarī rasa

## 3. VARTALOHA
(Bronze)

**Vartaloha- general information;**

Vartaloha is white coloured alloy metal used mainly for preparing utensils. It is also identified in classics as 'pañcaloha'. 'pañcarasa', 'bharta' and 'vartula'. Its first reference can be traced back to 13th century.

**Vartaloha- method of preparation:**

कांस्यं रीतिस्तथा ताम्रं नागो वङ्गश्च पञ्चमः । एकत्र द्रावितैरेतैः पञ्चलोहं प्रजायते ॥

(Āy. Pra. 4/82)

It is the alloy of 'kāṁsya' (bronze), 'tāmra' (copper), 'pittala' (brass), 'loha' (iron) and 'nāga' (lead). All these metals are melted together in equal ratio to obtain 'vartaloha'.

**Vartaloha śodhana:**

आदौ तैलादिके शोध्यं पश्चात्तप्त्वाऽजमूत्रके । निषिक्तं शुद्धिमायाति पञ्चलोहं न संशयः ॥

(Āy. Pra. 4/54)

द्रुतमश्वजले क्षिप्तं वर्तलोहं विशुद्ध्यति ॥ (R. R. S. 5/215)

After following 'sāmānya dhātu śodhana' method, the foils of 'vartaloha' (bronze) are heated red hot and dipped in a vessel containing 'aja-mūtra' (goat's urine) or 'haya-mūtra' (horse urine) for seven times, to purify the metal.

**Vartaloha māraṇa:**

अर्कक्षीरेण सम्पिष्टगन्धतालकलेपनात् । पञ्चकुम्भिपुटैर्भर्तं म्रियते योगवाहकम् ॥

(Āy. Pra. 4/85)

म्रियते गन्धतालाभ्यां पुटितं वर्तलोहकम् ॥ (R. R. S. 5/216)

The thin foils of 'śuddha vartaloha' (1 part) are cut into small pieces and taken in a clean khalva yantra. It is added with equal quantities of 'śuddha haratāla' and 'śuddha gandhaka'.

The mixture is thoroughly triturated by adding required quantity of 'arka dugdha' and later dried under hot sun. The drug powder obtained is enclosed in 'śarāva sampuṭa' and subjected to one 'gajapuṭa'.

This entire procedure is repeated for 5 times to obtain appropriately prepared 'vartaloha bhasma', which is later stored in suitable airtight containers for further pharmaceutical and therapeutic use.

**Vartaloha bhasma- dosage and adjuvant:**

Half rattī (62 mgs) to one rattī (125 mgs) is the general dosage of properly prepared 'vartaloha bhasma'. It is administered along with honey or any other suitable adjuvant depending on disease condition.

## Vartaloha bhasma- properties:

हिमाम्लं कटुकं  रूक्षं कफपित्तविनाशनम् । रुच्यं त्वच्यं क्रिमिघ्नञ्च नेत्र्यं मलविशोधनम् ।।
तद्भाण्डे साधितं सर्वमन्नव्यञ्जनसूपकम् । अम्लेन वर्जितञ्चापि दीपनं पाचनं हितम् ।।

(R. R. S. 5/214)

Appropriately prepared 'kāṁsya bhasma' possesses 'śīta vīrya', 'amla vipāka', 'kaṭu rasa'; and 'rūkṣya guṇa'. It mitigates vitiated kapha and pitta doṣa and is a good appetizer.

Its judicious use is beneficial in skin diseases, intestinal worms, eye diseases and is a good laxative. The foods cooked in 'bronze vessel' (except sour foods) are good appetizers, digestives and are good for health.

## Vartaloha bhasma- compound formulations:

Since it is alloy of five metals, its compound formulations are very rare.

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Chapter 19

# RATNOPARATNA

(Gems and Minor Gems)

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**Ratna- introduction:**

Ratna (also called a **gemstone, gem or precious stone**) is a piece of mineral, which, in cut and polished form, is used to make jewellery or other adornments. However certain rocks (such as lapis lazuli) and organic materials (such as amber or jet) are not minerals, but are still used for jewellery and are therefore often considered to be gemstones as well.

Most gemstones are hard, but some soft minerals are used in jewellery because of their lustre or other physical properties that have aesthetic value. Rarity is another characteristic that lends value to a gemstone.

In modern times gemstones are identified by 'gemologists', who describe gems and their characteristics using technical terminology specific to the field of gemology. The first characteristic a gemologist uses to identify a gemstone is its chemical composition. For example, 'diamonds' are made of carbon (C) and 'rubies' of aluminium oxide ($Al_2O_3$). Next, many gems are crystals which are classified by their crystal system such as cubic or trigonal or monoclinic.

Gems are characterized in terms of 'refractive index', 'dispersion', 'specific gravity', 'hardness', 'cleavage', 'fracture' and 'lustre'. They may exhibit 'pleochroism' or double refraction. They may have 'luminescence' and a 'distinctive absorption spectrum'.

**Ratna (gemstones)- etymology:**

रमणीयतरं यस्माद्रमन्तेऽस्मिन्नतीव वा । तस्माद्रत्नमिदं ख्यातं शब्दशास्त्रविशारदैः ॥ (R. T. 23/1)

The precious stones used for medicinal purposes in the field of 'Rasaśāstra' are branded as 'ratna'. These special stones are highly attractive and striking in comparison with other metals and minerals used in the field.

Human beings have always desired to have these stones as a sign of richness and pride. The term 'ratna' here, epitomizes all its above said qualities and the human aspirations.

**Ratna- definition:**

धनार्थिनो जनाः सर्वे रमन्तेऽस्मिन्नतीव यत् । अतो रत्नमिति प्रोक्तं शब्दशास्त्रविशारदैः ॥ (Āy. Pra. 5/2)

The precious stones (minerals) that attract the people who wish to have more richness and wealth are called 'ratna' (gemstones). In other words, these gemstones are so striking, attractive and expensive that people will be naturally lured towards them.

**Ratna- definition:**

जातौ जौ यदुत्कृष्टं तद्धि रत्नं प्रचक्षते । रत्नं च वरपाषाणं रमन्ते यत्र मानवः ॥

(Raghuvaṁśam)

Mineral stones with 'most brilliant qualities' in their own category are branded as precious and are called as 'ratna'. Since they are precious (varapāṣāṇa), they lure the people towards them.

**Ratna- synonyms:**

'Ratna', 'Maṇi' and 'Varapāṣāṇa'; are the synonymous words used in the classics for these precious mineral stones.

**Ratna- categorization:**

Depending on the quality, the gemstones are categorized into two groups as;

1. Ratna (Precious stones or Gems) and
2. Uparatna (Semiprecious stones or Miner gems)

**Nava-ratna (Nine gemstones):**

माणिक्यमुक्ताफलविद्रुमाणि तार्क्ष्यञ्च पुष्पं भिदुरञ्च नीलम् ।
गोमेदकञ्चाथ विदुरकञ्च क्रमेण रत्नानि नवग्रहाणाम् ॥ (R. R. S. 4/5)

The 'nine ratna' are mentioned in the table below with relevant details;

| | Ratna | English name | Chemical Identity | Hard-ness | Den-sity | Color |
|---|---|---|---|---|---|---|
| 1 | Māṇikya | Ruby | $Al_2O_3$ | 9 | 4 | Red |
| 2 | Muktāphala | Pearl | $CaCO_3$ | 3.5 | 2.65 to 2.89 | Silver white |
| 3 | Pravāla (Vidruma) | Coral | $CaCO_3$ | 3.5 | 2.6 to 2.7 | Red |
| 4 | Tārkṣya (Marakata) | Emerald | $Be_3Al_2(SiO_3)$ | 7.5 | 2.71 | Green |
| 5 | Puṣpa (Puṣparāga) | Topaz | $Al\ (FOH)_2\ SiO_4$ | 8 | 3.6 | Golden yellow |
| 6 | Vajra (Bhidura) | Diamond | C (Carbon) | 10 | 3.6 | White |
| 7 | Nīla (Indranīla) | Sapphire | $Al_2O_3$ | 9 | 4 | Deep blue |

| | Ratna | English name | Chemical Identity | Hard-ness | Den-sity | Color |
|---|---|---|---|---|---|---|
| 8 | Gomeda | Zircon/Hessonite/ Cinnamone stone | Zr $SiO_4$ | 7.5 | 4.65 to 4.71 | Dark brown |
| 9 | Vaiḍūrya | Cat's eye | BeO $Al_2O_3$ | 8.5 | 3.5 to 3.8 | Yellowish green |

**Ratna and navagraha:**

Each ratna is related with one 'graha' (planets) as per few classical books. Māṇikya with 'Sūrya graha' (sun); Muktā with 'Candra graha' (moon); Pravāla with 'Maṅgala graha'; Tārkṣya with 'Budha graha'; Puṣparāga with 'Guru graha'; Hīraka (vajra) with 'Śukra graha'; Nīla with 'Śani graha'; Gomeda with 'Rāhu graha'; and Vaiḍūrya with 'Ketu graha'.

Comments: This above correlation between 'ratna' and 'navagraha' is done based on the belief that, by wearing these gemstones on our body, the bad influences of the 'graha' (planets) can be averted.

Many people disagree with this, stating it as unscientific and incongruous. This correlation emanates from the books of 'Jyotiṣa śāstra', which is quoted by some books of 'Āyurveda'.

The term 'graha' here means 'planet'. In the 'nava graha' (9 graha) correlation with each 'ratna', 'sun' is not a planet it is a star; 'moon' is not a 'graha' instead a 'upagraha'; 'rāhu' and 'ketu' are fictious names and are not identified as 'graha'. Therefore, with these considerations, the above correlation seems completely unscientific.

Moreover, these stones are chemically same as any other mineral. Furthermore, they are not proved to have any considerable effect on the human body unless they are pharmaceutically processed and administered internally in suitable dosage form. Since 'science' and 'fiction' cannot go hand in hand, this kind of explanations in the books remain contentious always.

**UPARATNA (Semiprecious stones)**

वैक्रान्तं सूर्यकान्तश्च चन्द्रकान्तो नृपोपलः । पैरोजकञ्च स्फटिकं क्षुद्ररत्नगणो ह्ययम् ॥

(R. T. 23/154)

There are six upa or kṣudra ratna mentioned in the classics, they are 1. Vaikrānta 2. Sūryakānta 3. Candrakānta 4. Rājāvarta 5. Pairojaka 6. Sphaṭika.

With few additions to the CCIM syllabus there are eleven drugs counted as 'uparatna'. They are provided in the below table;

| | Uparatna | English name | Chemical identity | Hard-ness | Color |
|---|---|---|---|---|---|
| 1 | Vaikrānta | Tourmaline | $(Mg,Mn,Fe,Ca,Na,K, Li,H,F,Al_3,B_2,SiO_4,O_2)$ | 4 | Wide range |
| 2 | Sūryakānta | Sun stone/ Feldspar | $(Na_2O\ Al_2O_3\ 6SiO_2+ CaO, Al_2\ O_3\ 2SiO_2)$ | 6 | Wide range |
| 3 | Candrakānta | Moon stone | $(KAl\ Si_3\ O_8)$ | 6 | Wide range |
| 4 | Rājāvarta | Lapis lazuli/ Altra marine | $(Na_4\ (S_3Al)\ Al_2\ (SiO_4)_3)$ | 5.5 | Intense blue |
| 5 | Perojaka | Torquoise | $CuAl_6(PO_4)_4(OH)_8 5H_2O$ | 6 | Wide range |
| 6 | Sphaṭika | Quartz/Rock crystal | $(SiO_2)$ | 7 | White |
| 7 | Vyomyāṣma | Jade | $(Na\ Al\ (SiO_3))$ | 7 | Varies |
| 8 | Tṛṇakānta | Amber/ Succinum | $C_6H_{16}O$ | 2.5 | Varies |
| 9 | Palaṅka | Onyx | $(CaSO_4\ 2H_2O)$ | 7 | Varies |
| 10 | Puttika | Peridot | $(Mg, Fe)_2\ SiO_4$ | 6.5 | Varies |
| 11 | Rudhira | Carneline | $SiO_2$ | 7 | Varies |

However, CCIM has added 8 more drugs to the list of uparatna and at present, the list has 19 drugs in it. Along with the uparatna mentioned in the above table, the remaining drugs are;

1. Badarāśma (Silicate of lime)
2. Jaharamoharā (Serpentine) ($H_4\ Mg_3\ Si_2\ O_9$)
3. Kouśeyāśma (Asbestos; Silicate of magnesium)
4. Dugdhapāṣāṇa (Talc; Magnesium)
5. Godantī (Gypsum/Calcium sulphate; $CaSO_4\ 2H_2O$)
6. Sugandhikam (Spinel)
7. Ākīka (Agate) and
8. Opal

**Ratnoparatna- sources:**

Though majority of 'ratnoparatna' are from mineral source, some have animal and plant sources also. Therefore, depending on the 'source', the gemstones can be categorized as below;

1. Khanija (parvataja): (mineral)
   Māṇikya (ruby), Tārkṣya (emerald), Puṣparāga (topaz), Vajra (diamond), Nīla (sapphire), Gomeda (zircon) and Vaidūrya (cat's eye).
2. Prāṇija (jalaja): (organic)
   Muktā (pearl) and Pravāla (coral).

3. Vānaspatika (audbhida): (herbal)
   Tṛṇakānta (amber).

**Pañca-ratna:**

The set of five gemstones that are rated high in their qualities and prize are branded as 'pañca-ratna'. They are;

1. Māṇikya (ruby),
2. Tārkṣya (emerald),
3. Puṣparāga (topaz),
4. Vajra (diamond),
5. Nīla (sapphire)

**How are gemstones formed?**

Many of us own beautiful pieces of handmade jewellery containing different gemstones. We refer to diamonds, emeralds, rubies and sapphires as precious gemstones because of their rare appearance and high value. All other stones are called 'semi-precious' even though the pieces containing the stone are certainly not! Ancient people even used gemstones as a form of currency. You may be able to appreciate the beauty of a gemstone, but have you ever wondered how it was formed?

Nearly all gemstones are formed beneath the Earth's surface. The process involved in the creation of the different stones can vary greatly. Many stones are formed when minerals react with the water that is near the Earth's surface and then dissolve. When this solution evaporates or cools, minerals form.

Water that mixes with silica-rich rocks such as sandstone will produce gemstones such as amethysts, agates and opals. When copper-rich rocks mix with water, copper-bearing minerals such as malachite, turquoise and azurite are formed. Turquoise has been mined for more than 4000 years and ancient Egyptians considered the gemstone a very precious commodity.

Other gemstones such as 'emeralds' and 'tourmalines' are formed when rain water or water from cooling bodies of magma mix with minerals and then crystallize in open cracks or cavities. These spaces become filled with veins of minerals to create what is called hydrothermal deposits.

Magma is a mixture of crystals, dissolved gas and liquid rock beneath the Earth's surface. Zircons, topazes and rubies are created by crystallizing in the magma or gas bubbles that occur in volcanic rocks. This process produces what are known as magmatic gems.

Other gemstones are formed directly in the mantle. This layer makes up almost 70% of the Earth's mass and is made up of iron, magnesium, silicon, oxygen, aluminum and silicate compounds.

The upper layer of the mantel contains a large volume of the olive-green mineral olivine. This is one of the most common of all Earth's minerals and transparent olivine is known as the gemstone peridot which is the French word for 'olivine'.

The word 'metamorphic' is defined as a metamorphosis or change of form. Metamorphic gems such as jade, garnet, aquamarine, emerald, ruby, sapphire, lapis lazuli, onyx and zircon are formed over time when rocks are altered by intense heat and pressure as well as interaction with solutions.

Countries such as Myanmar which was formerly Burma, Thailand and Sri Lanka contain large regions of metamorphic rock which contains mineral called corundum. This mineral crystallizes under heat and pressure and becomes the rubies and sapphires. Colombia in South America produces the majority of the world's emeralds.

Diamonds are sometimes formed in metamorphic rocks although this process is rare. Most diamonds come from volcanic rocks called kimberlite. These rocks are named after the South African town of Kimberley where they were first discovered. Each ton of rock will only produce a few carats of diamond. In fact, the stone in a regular diamond ring will require the removal of 200 to 400 times its volume of rock!

The gemstones require a unique combination of chemical elements, pressure and temperature to form. It's amazing to think that the processes occurring deep beneath the Earth's crust are able to produce such beautiful, colorful stones.

## CLASSIFICATION OF GEMSTONES IS BASED UPON

### 1. Chemical composition:

A gemstone may be a pure chemical element (diamond is essentially pure carbon), a relatively simple chemical compound (quartz is silicon dioxide, SiO2), or a more complex mixture of various compounds and elements (the garnet family includes a highly variable mix of iron, magnesium, aluminum, and calcium silicates).

The great majority of familiar gem materials are oxides or silicates (i.e., they contain oxygen and perhaps silicon) and formed as crystals during the cooling of the earth's crust over past millennia.

**2. Crystal structure:**

Gemstones may be formed in single or multiple discrete *crystals* (such as diamond), in massive collections of microscopic crystals (cryptocrystalline) (such as chalcedony), or in *amorphous* (non-crystalline) masses (such as opal). In general, larger crystals were formed in areas of slow cooling of molten rock, and smaller crystals in areas of more rapid cooling.

There are several classes of crystal structure based on symmetry of the resulting crystals, and there are also noncrystalline (amorphous) minerals used as gem materials. In addition, there are some organic materials (such as shell and bone) that have been used traditionally as gem materials.

**3. Crystal systems:**

Cubic: Crystals in the cubic, or isometric, system have three mutually perpendicular axes of equal length. Common forms in the cubic system are the tetrahedron (4 faces), the cube (6 faces), the octahedron (8 faces), the dodecadehedron (12 faces), the trapezohedron (24 faces), and the hexoctahedron (48 faces). Gemstones occurring in cubic crystal forms include diamond, the garnets, pyrite, and spinel.

Hexagonal: Crystals in the hexagonal system have four axes, three of which are of equal length and intersect at 60 degree angles within a plane, and the fourth of which is perpendicular to the plane of the other three. Gemstones occurring in hexagonal crystals include beryl, corundum, quartz, and tourmaline. Some crystallographers further identify two subdivisions of hexagonal crystals—**trigonal** (corundum) and **rhombohedral (quartz)**.

Tetragonal: Tetragonal crystals have three axes intersecting at 90 degree angles, two of which are of equal length. Examples include zircon, rutile, and scapolite.

Orthorhombic: Orthorhombic crystals have three axes at 90 degree angles , all of which have different lengths. A typical example is topaz.

Monoclinic: Monoclinic crystals have three axes of unequal length, two of which intersect at an angle other than 90 degrees, and both perpendicular to the third. Jadeite and nephrite are common examples.

Triclinic: Triclinic crystals have three axes, all of unequal length and intersecting at angles other than 90 degrees. Examples include labradorite and microcline feldspar.

### 4. Optical characteristics:

Optical characteristics of gemstones are primarily derived from their chemical composition and crystal structure.

Color: Color is the apparent result of selective absorption or transmission of different frequencies of visible light. Color can be described as the combination of three characteristics—hue, tone, and intensity. Hue is a function of the frequency of light and is described by familiar terms such as red, orange, yellow, blue, green, indigo, and violet.

Tone is a variation from very light to very dark. Intensity is a measure of saturation, or purity, of a color. The typical human eye can identify approximately 150 pure hues, but around one million colors. The differences among colors may be immediately obvious or so subtle that direct comparison under controlled conditions is required to discern them.

Color acuity is also highly affected by fatigue, diet, and other factors, so it is unwise to attempt judging subtle color differences in gemstones such as diamond without attention to the physical and emotional condition of the observer, as well as properly graded comparison stones and careful control of lighting conditions.

Pleochroism is the apparent change in color of a doubly refractive gemstone when viewed through different directions of the crystal structure. In most cases, the color variations are not obvious to the unaided eye and must be viewed through a polariscope or dichroscope, but in some cases, the pleochroic colors are strikingly obvious.

For example, many green tourmalines appear black through the C axis of the crystal, and iolite shows a striking combination of blue-violet and near colorless. Dichroism refers to the display of two ("di") pleochroic colors in a gemstone.

Alexandrite-like color change, or photochroism, is the marked change in perceived color of a gemstone under different lighting conditions. As the name implies, the most famous example appears in alexandrite, a form of chrysoberyl that typically appears blue or green in daylight and red or purplish in incandescent light, but similar color changes may be observed in sapphire, garnet, and tourmaline.

The phenomenon is due to selective absorption of different wavelengths of light, and the predominance or absence of those wavelengths in the prevailing light (incandescent light has proportionately higher quantities of reddish wavelengths and less of blue or green).

Optic character: Gemstones may affect the passage of light differently through different directions in the crystal structure. If the velocity of light is constant through all directions in the stone, the stone is said to be singly refractive, or isochroic, and has one refractive index.

This is characteristic of isometric crystals. If the velocity of light varies with direction, the stone is doubly refractive, or anisotropic, and has two refractive indices. In anisotropic materials, light is separated into two polarized components, the ordinary ray and the extraordinary ray. Anisotropic materials can be further characterized as uniaxial, biaxial positive, and biaxial negative.

Amorphous (non-crystalline) materials, such as opal, amber, and glass, may scatter light in unusual directions due to internal stress and display a phenomenon known as anomalous double refraction.

Refractive index: Refractive index, or R.I., is the ratio of the velocity of light in air to the velocity of light through a transparent material. If light passes from air into a transparent material at an angle of incidence other than a 90 degree angle, it is deflected at a different angle (the coincident angle) according to the R.I. Gemstones with higher R.I. are generally more brilliant than those with low R.I.

For example, diamond has an R.I. of about 2.4; quartz, about 1.54-1.55. The R.I. of most gemstones is easily measured using a simple optical instrument known as a refractometer.

Birefringence: Birefringence is the difference in value between the highest and lowest refractive indices in a doubly refractive (anisotropic) material. Depending on the orientation of a faceted stone, this can result in a "fuzzy" appearance and apparent doubling of facets viewed through the stone.

Dispersion: Dispersion is the ability of a gemstone to separate light into its component colors; that is, the quality of passing different wavelengths of light at different velocities. Dispersion is the quality in a diamond that produces sparkles of color in an otherwise colorless stone. Quartz, which has a dispersion of 0.013, shows much less of this effect than diamond, which has a dispersion of 0.044. Diamond, in turn, shows much less color play than sphalerite, which has a dispersion of 0.156.

Fluorescence: Many materials are fluorescent. That is, when exposed to ultraviolet light or X-rays, they transform some of the incoming energy into visible light. The color and intensity of the fluorescence is often indicative, but not conclusive, of the identity of the material. For example, natural yellow sapphires from Ceylon show a distinctive apricot-colored fluorescence, while synthetic yellow sapphires generally show no fluorescence or a dull red when exposed to long-wave ultraviolet (UV) light.

Most natural emeralds are inert (non-fluorescent) under long-wave UV, and most synthetic emeralds show a moderate to strong red fluorescence. Because of the prominent exceptions, this test alone is inconclusive.

Phosphorescence: If a fluorescent material continues to emit light after the exciting UV or X-ray light is removed, it is said to be phosphorescent. This phenomenon usually lasts only a few seconds but may occasionally persist for much longer periods. This is a relatively rare characteristic in gemstones.

Clarity: Gemstones can vary from complete opacity to lucid clarity and may contain few or many inclusions such as crystals of other minerals, gas- or liquid-filled cavities, or even insects! (Large, perfectly preserved insect specimens in amber are highly prized.)

In some gemstones, such as emerald, certain inclusions are highly distinctive and can be used as reliable indicators of identity. A gemological microscope (a binocular microscope with a typical magnification of 10X to 40X) is one of the most useful tools in identifying many gemstones, as well as grading them on relative clarity.

### 5. Specific gravity:

Gem materials vary greatly in density—amber may float in salt water (density near that of water), while hematite is more than five times the density of water. This is why two different gemstones may have the same size but different weights and vice versa—a one carat round brilliant diamond of typical proportions will be approximately 6.5 mm in diameter, while a round brilliant ruby of the same size (6.5 mm in diameter) and proportions will weigh approximately 1.55 carats. Generally, gemologists refer to *specific gravity*, or *relative density*—the ratio of the density of a gemstone relative to that of water.

### 6. Durability:

The two most familiar qualities of durability—hardness and toughness—are often misunderstood. Hardness is resistance to scratching or piercing. Toughness is resistance to breakage. The combination of the two largely defines the durability of a gemstone. Diamond is the hardest naturally occurring material and is also quite tough; however, it can be broken by a hard blow.

Jadeite and nephrite (the jades) are much softer and relatively easy to scratch but are perhaps the toughest gem materials. Hardness is often represented on the Mohs scale, a nonlinear scale of scratch resistance varying from 1 (talc) to 10 (diamond). The Mohs scale can be misleading—there is a much greater difference in hardness between 9 (corundum) and 10 (diamond) than between 9 and 1 (talc).

More precise, and less familiar, measurements of hardness are done using other systems, such as the Knoop scale of resistance to indentation. Because of the likelihood of physical damage, hardness tests are NOT recommended for gem identification. Resistance to chemical degradation or to changes in temperature or humidity are important.

Turquoise is often quite porous and can be discolored by exposure to oils. Opals are heat-sensitive and have a high water content; sudden temperature changes or extremely dry conditions can cause them to crack or craze.

Thermal conductivity (the ability to conduct heat) is very low in most gemstones but is extremely high in diamond (from 1.6 to 4.8 times as great as in pure silver!). This unusual property of diamond is the basis for several popular diagnostic probes that are used to distinguish diamond from its numerous imitations.

**Ratna doṣa (Natural defects in gemstones):**

> ग्रासस्त्रासश्च विन्दुश्च रेखा च जलगर्भता । सर्वरत्नेष्वमी पञ्च दोषा साधारणा मताः ।।
> क्षेत्रतोयभवा दोषा रत्नेषु न लगन्ति ते ।। (R. R. S. 4/32)

The doṣa found in gemstones are 1. Grāsa 2. Trāsa 3. Bindu 4. Rekhā and 5. Jalagarbhatā. However, these gemstones do not possesses 'kṣetrīya' and 'toya' (jalīya) doṣa. The meaning of the above listed out five 'ratnadoṣa' are as below;

| Ratna doṣa | Description |
|---|---|
| 1. Grāsa | If some portion of the gemstone is opaque or black in colour such a defect is called as 'grāsa doṣa'. |
| 2. Trāsa | If the gemstone has admixture of colours other than its natural colour such a defect is called as 'trāsa doṣa'. |

| Ratna doṣa | Description |
|---|---|
| 1. Bindu | If the gemstone possesses a small point in its natural colour, such a defect is termed as 'bindu doṣa'. |
| 2. Rekhā | If the gemstone possesses single, parallel or intersecting lines in its body, such a defect is termed as 'rekhā doṣa'. |
| 3. Jalagarbhatā | If the gemstone possesses a water bubble in its body, such a defect is termed as 'jalagarbhatā doṣa'. |

Note: The gemstones are expected not to have any above said 'natural defects'. If present, the price and the demand for such gemstones come down. However, the perfect gemstones with high price and demand are very rare and can hardly be procured and used for pharmaceutical procedures.

In fact, the use of 'ratna bhasma' for therapeutic purposes is rarely seen now-a-days because of the rarity in gemstones and the high cost it involves. If at all, any pharmaceutical processing is carried out, the powdery part of any gemstone generated during its cutting and sophistication process is collected for much lower price and used.

**Ratna- influence of atmospheric conditions:**

न जरा यान्ति रत्नानि विद्रुमं मौक्तिकं विना ।। (Ratna-Dhātu Vijñāna)

Except gemstones of 'animal source' namely 'vidruma' (coral) and 'muktā' (pearl), all the remaining gemstones of mineral origin will never be influenced by the atmospheric conditions such as air, water and sun. They stay spotless for many years.

**Ratna- therapeutic values:**

When used for the therapeutic purposes in appropriate dosage form and dose, these gemstones possess good healing values. In general, the incinerated gemstones possess 'madhura and kaṣāya rasa', 'śīta and sara guṇa' and they mitigate vitiated pitta doṣa.

These bhasma are good appetizers, they improve the body radiance and they possess lekhana, viṣahara and netra-rogahara properties. When processed with mercury, these bhasma attain higher therapeutic values.

**Ratna śodhana:**

मुक्तादिष्वविशुद्धेषु न दोषः स्याच्च वस्तुतः । तथाहि गुणवृद्धिः स्याच्छोधनेन विशेषतः ।।

(R. Ci. 7/69)

The purification process is must for all the gemstones of mineral origin. However, some relaxation may be given in case of gemstones from animal origin (pearl and coral) and plant origin (amber).

Nevertheless, carrying out classically mentioned 'sāmānya' and 'viśeṣa' śodhana is advised here for categories of gemstones. Because the process of śodhana fortifies and adds on to the existing therapeutic properties of these gemstones.

**General method of ratna śodhana:** (R. R. S. 4/64-65)

> शुद्ध्यत्यम्लेन माणिक्यं जयन्त्या मौक्तिकं तथा । विद्रुमं क्षारवर्गेण ताक्ष्यं गोदुग्धकैस्तथा ।।
> पुष्परागं च सन्धानैः कुलत्थक्वाथसंयुतैः । तण्डुलीयजलैर्वज्रं नीलं नीलीरसेन च ।।
> रोचनाभिश्च गोमेदं वैदूर्यं त्रिफलाजलैः ।। (R. R. S. 4/62)

The ratna are purified by subjecting them to swedana in dolāyantra for one yāma (3 hours) by keeping different liquid medias as mentioned below;

| | Ratna | Liquid media for dolāyantra śodhana |
|---|---|---|
| 1 | Māṇikya | Amladrava (any of the sour liquids; nimbū rasa, cāṅgerī swarasa etc) |
| 2 | Muktāphala | Jayantī swarasa |
| 3 | Pravāla (Vidruma) | Kṣārīya drava (yavakṣāra jala, sarjakṣāra jala or ṭaṅkaṇa kṣāra jala) |
| 4 | Tārkṣya (Marakata) | Godugdha (cow's milk) |
| 5 | Puṣpa (Puṣparāga) | Kāñjī + kulattha kwātha |
| 6 | Vajra (Bhidura) | Taṇḍulodaka (rice washed water) |
| 7 | Nīla (Indranīla) | Nīlī vṛkṣa swarasa |
| 8 | Gomeda | Gorocana jala |
| 9 | Vaidūrya | Triphalā kwātha |

**General method of ratna māraṇa:**

> लकुचद्रावसंपिष्टैः शिलागन्धकतालकैः । वज्रं विनान्यरत्नानि म्रियन्तेऽष्टपुटैः खलु ।।
> (R. R. S. 4/66)

1. The fine powders of any of the individual śuddha ratna (except vajra) - 1 part; 2. Śuddha manaḥśilā - 1 part; 3. Śuddha gandhaka - 1 part; and 4. Śuddha haratāla - 1 part; all these are taken in a clean khalva yantra and subjected for 3 bhāvanās with 'lakuca swarasa'.

Later cakrikās are prepared, dried and enclosed in śarāva sampuṭa. This sampuṭa is subjected for one gajapuṭa. This whole process is repeated for 8 times to obtain properly prepared bhasma of six gemstones of mineral origin except vajra.

Note: The incineration of vajra does not feature in this 'sāmānya ratna māraṇa'. Its 'viśeṣa śodhana' has to be referred in that particular chapter.

### 1. MĀṆIKYA

(Ruby; $Al_2O_3$)

**Introduction:**

Māṇikya (**ruby**) is a blood-red colored gemstone. The red color of ruby is caused mainly by the presence of the element 'chromium'. Its name comes from *ruber*, Latin for red. Chemically it is aluminium oxide ($Al_2O_3$) with hardness 9.0 on the Mohs scale and specific gravity of 4.

**Occurrence:**

The Mogok Valley in Upper Myanmar (Burma) was for centuries the world's main source for rubies. That region has produced some of the finest rubies ever mined, but in recent years very few good rubies have been found there. The very best color in Myanmar rubies is sometimes described as "pigeon's blood."

In Central Myanmar, the area of Mong Hsu began producing rubies during the 1990s and rapidly became the world's main ruby mining area. The most recently found ruby deposit in Myanmar is in Namya (Namyazeik) located in the northern state of Kachin.

Rubies have historically been mined in Thailand, the Pailin and Samlout District of Cambodia, Burma, India, Afghanistan and in Pakistan. In Sri Lanka, lighter shades of rubies (often "pink sapphires") are more commonly found.

After the Second World War ruby deposits were found in Tanzania, Madagascar, Vietnam, Nepal, Tajikistan, and Pakistan. More recently, large ruby deposits have been found under the receding ice shelf of Greenland.

In 2002 rubies were found in the Waseges River area of Kenya. There are reports of a large deposit of rubies found in 2009 in Mozambique, in Nanhumbir in the Cabo Delgado district of Montepuez.

Spinel, another red gemstone, is sometimes found along with rubies in the same gem gravel or marble. Red spinel may be mistaken for ruby by those lacking experience with gems. However, the finest red spinels can have a value approaching that of the average ruby.

**Māṇikya- synonyms:**

माणिक्यं रङ्गमाणिक्यं पद्मरागसमाह्वयम् । रविरत्नं शोणरत्नं कुरुविन्दं च लोहितम् ।। (R. T. 23/43) ever, some relaxation may be given in case of gemstones from animal origin (pearl and coral) and plant origin (amber).

Nevertheless, carrying out classically mentioned 'sāmānya' and 'viśeṣa' śodhana is advised here for categories of gemstones. Because the process of śodhana fortifies and adds on to the existing therapeutic properties of these gemstones.

**General method of ratna śodhana:** (R. R. S. 4/64-65)

> शुद्ध्यत्यम्लेन माणिक्यं जयन्त्या मौक्तिकं तथा । विद्रुमं क्षारवर्गेण ताक्ष्यं गोदुग्धकैस्तथा ।।
> पुष्परागं च सन्धानैः कुलत्थक्वाथसंयुतैः । तण्डुलीयजलैर्वज्रं नीलं नीलीरसेन च ।।
> रोचनाभिश्च गोमेदं वैदूर्यं त्रिफलाजलैः ।। (R. R. S. 4/62)

The ratna are purified by subjecting them to swedana in dolāyantra for one yāma (3 hours) by keeping different liquid medias as mentioned below;

| | Ratna | Liquid media for dolāyantra śodhana |
|---|---|---|
| 1 | Māṇikya | Amladrava (any of the sour liquids; nimbū rasa, cāṅgerī swarasa etc) |
| 2 | Muktāphala | Jayantī swarasa |
| 3 | Pravāla (Vidruma) | Kṣārīya drava (yavakṣāra jala, sarjakṣāra jala or ṭaṅkaṇa kṣāra jala) |
| 4 | Tārkṣya (Marakata) | Godugdha (cow's milk) |
| 5 | Puṣpa (Puṣparāga) | Kāñjī + kulattha kwātha |
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**General method of ratna māraṇa:**

> लकुचद्रावसंपिष्टैः शिलागन्धकतालकैः । वज्रं विनान्यरत्नानि म्रियन्तेऽष्टपुटैः खलु ।।
> (R. R. S. 4/66)

1. The fine powders of any of the individual śuddha ratna (except vajra) - 1 part; 2. Śuddha manaḥśilā - 1 part; 3. Śuddha gandhaka - 1 part; and 4. Śuddha haratāla - 1 part; all these are taken in a clean khalva yantra and subjected for 3 bhāvanās with 'lakuca swarasa'.

Later cakrikās are prepared, dried and enclosed in śarāva sampuṭa. This sampuṭa is subjected for one gajapuṭa. This whole process is repeated for 8 times to obtain properly prepared bhasma of six gemstones of mineral origin except vajra.

Note: The incineration of vajra does not feature in this 'sāmānya ratna māraṇa'. Its 'viśeṣa śodhana' has to be referred in that particular chapter.

## 1. MĀṆIKYA

(Ruby; $Al_2O_3$)

### Introduction:

Māṇikya (**ruby**) is a blood-red colored gemstone. The red color of ruby is caused mainly by the presence of the element 'chromium'. Its name comes from *ruber*, Latin for red. Chemically it is aluminium oxide ($Al_2O_3$) with hardness 9.0 on the Mohs scale and specific gravity of 4.

### Occurrence:

The Mogok Valley in Upper Myanmar (Burma) was for centuries the world's main source for rubies. That region has produced some of the finest rubies ever mined, but in recent years very few good rubies have been found there. The very best color in Myanmar rubies is sometimes described as "pigeon's blood."

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Spinel, another red gemstone, is sometimes found along with rubies in the same gem gravel or marble. Red spinel may be mistaken for ruby by those lacking experience with gems. However, the finest red spinels can have a value approaching that of the average ruby.

### Māṇikya- synonyms:

माणिक्यं रङ्गमाणिक्यं पद्मरागसमाह्वयम् । रविरत्नं शोणरत्नं कुरुविन्दं च लोहितम् ।। (R. T. 23/43)

Raṅgamāṇikya, padmarāja, ravi ratna, śoṇaratna, kuruvinda, lohita; sougandhika and ratnarāṭ; all these are the synonymous words used in the classics for 'māṇikya' (ruby).

**Māṇikya (ruby)- brief history:**

Since ages we find the references of 'gemstones' in Indian history. Māṇikya (ruby) has lured people of all centuries. We find the references of 'māṇikya' in 'Śrīmadbhāgavata', the stories of 'Mahābhārata' and in the 'Bṛhat Saṁhitā'.

From the period of 'Saṁhitā', the therapeutic use of 'māṇikya' was thought about. Later with development of 'Rasaśāstra', the purification, incineration, piṣṭi preparation and the therapeutic utility of all gemstones was in practice.

**Māṇikya- types:**

माणिक्यं पद्मरागाख्यं द्वितीयं नीलगन्धि च ॥

(R. R. S. 4/8)

(I) Two types of māṇikya:

1. Padmarāga: (śreṣṭha)

   This variety of 'māṇikya' has radiance of red rose. It will be clean, unctuous, heavy lustrous, cylindrical and even sized. Found in whichever part of the world, it comes with these characters.

2. Nīlagandhi:

   This 'māṇikya' variety appears red from outside but possesses bluish colour from within. It is found in river 'Gaṅgā'. Excluding its colour if all other properties of this variety are same like earlier one, it can also be considered as 'śreṣṭha'.

(II) Four types of māṇikya; depending on colour:

1. Rakta (reddish)
2. Pītābha (yellowish)
3. Haritābha (greenish)
4. Raktābha pīta (reddish yellow)

**Māṇikya- grāhya swarūpa:**

रक्तोत्पलदलच्छायं रम्यं दीप्तप्रभ परम् । वृत्तायतं, समाङ्गञ्च माणिक्यं जात्यमुच्यते ॥

(R. T. 23/44)

The 'māṇikya' (ruby), which resembles the colour of 'rakta kamala patra', which is beautiful to look, which has lustrous outer surface and which is round, smooth and long bodied; is identified as the best variety of 'ruby' and selected for pharmaceutical purposes.

### Māṇikya- agrāhya swarūpa:

विच्छायं लघु धूमाभं विरूपं कर्कशं परम् । मलिनं चिपिटं वक्रं माणिक्यं त्याज्यमुच्यते ।।

(R. T. 23/45)

The 'māṇikya' (ruby), which is lustre less, light weighted, smoky coloured, shapeless, rough surfaced, unclean and flat bodied; is rejected for pharmaceutical use.

### Māṇikya śodhana- 1st method:

निम्बूकस्वरसेनेह दोलायन्त्रे विधानतः । यामैकं स्वेदितं कामं माणिक्यं शुद्धिमाप्नुयात् ।।

(R. T. 23/46)

The roughly pounded 'māṇikya' is tied in a 'poṭṭalī' and subjected for 3 hours (one yāma) of 'swedana' in 'dolāyantra' by keeping 'nimbū swarasa' as liquid media. Later the drug is dried and stored in airtight container as 'śuddha māṇikya'.

Alternatively, the 'māṇikya' may be subjected for 3 hours (one yāma) of 'swedana' in 'dolāyantra' by keeping any of the 'amla dravya swarasa' as liquid media to purify the same.

### Māṇikya śodhana- 2nd method:

निम्बूकाम्लयुतं वारा माणिक्यं चषकस्थितम् । सुराप्रदीपे संपक्वं शुद्धिमायात्यनुत्तमाम् ।।
आविष्कृतो विधिरयं गुरुवयमहोदयैः । प्रकाशितः खलु मया भिषजां हितकाम्यया ।।

(R. T. 23/48-49)

The required quantity of 'māṇikya' is taken in a clean glass beaker placed over tripod stand. It is added with enough quantity of 'diluted citric acid' (sadrava nimbūkāmla).

Now an ignited spirit lamp is placed below the tripod stand and the content in the beaker is boiled for 2 to 3 hours. Later, when cool on its own, the drug is collected, dried and stored as 'śuddha māṇikya' for further pharmaceutical use.

### Māṇikya sāmānya māraṇa:

लकुचद्रावसंपिष्टैः शिलागन्धकतालकैः । वज्रं विनान्यरत्नानि म्रियन्तेऽष्टपुटैः खलु ।।

(R. R. S. 4/66)

1. The fine powders of any of the individual śuddha ratna (except vajra) - 1 part; 2. Śuddha manaḥśilā - 1 part; 3. Śuddha gandhaka - 1 part; and 4. Śuddha haratāla - 1 part; all these are taken in a clean khalva yantra and subjected for 3 bhāvanās with 'lakuca swarasa'.

Later cakrikās are prepared, dried and enclosed in śarāva sampuṭa. This sampuṭa is subjected for one gajapuṭa. This whole process is repeated for 8 times to obtain properly prepared bhasma of six gemstones of mineral origin except vajra.

**Māṇikya māraṇa- 1st method:**

विमलीकृतमत्यर्थं माणिक्यं सुविचूर्णितम् । शिलालगन्धैर्विमलैः पृथक् तु समभागिकैः ।।
निम्बूकस्वरसेनेह पेषयेद्दिनसप्तकम् । विन्यसेत्सम्पुटे घर्मे विशुष्कं कृतचक्रिकम् ।।
ततस्तु पुटयेद्धीमान् पुटे वारणसंज्ञके । रीत्यानया सुपुटितमष्टवारं प्रयत्नतः ।।
माणिक्यं म्रियते भस्म जायते पाण्डुरप्रभम् । पिष्टं तु लकुचद्रावैः पुटेदेवमथापि वा ।।

(R. T. 23/50-53)

One part of 'śuddha māṇikya' is taken in a clean khalva yantra. It is carefully pounded and triturated to bring it in fine powder form. This powder is added with equal quantities of 'śuddha manaḥśilā', 'śuddha haratāla' (āla) and 'śuddha gandhaka' and triturated to obtain a homogenous mixture.

This mixture is added with required quantity of 'nimbū swarasa' and triturated thoroughly for seven days. Later the 'cakrikās' (pellets) of even size and shape are prepared, dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'.

This entire procedure and the 'gajapuṭa' is repeated for 8 times to obtain pale white coloured and appropriately prepared 'māṇikya bhasma'. Later it is stored in suitable airtight container for further therapeutic use.

Note: Instead of 'nimbū rasa', 'lakuca swarasa' may also be used in the process to obtain perfect 'māṇikya bhasma'.

**Māṇikya māraṇa- 2nd method:**

चूर्णीकृतं शोणरत्नं विमलैः समभागिकैः । पेषयेन्निम्बुकद्रावैर्बलिरोगशिलेङ्गुलैः ।।
विमर्द्य सुदृढे खल्वे यत्नेन सप्तवासरम् । पुटयेद्वारणपुटे विशुष्कं कृतचक्रिकम् ।।
रीत्यानयापि पुटितमष्टवारमसंशयम् । माणिक्यमचिरादेव मृतिमाप्नोत्यनुत्तमाम् ।।

(R. T. 23/54-56)

One part of 'śuddha māṇikya' is taken in a clean khalva yantra. It is carefully pounded and triturated to bring it in fine powder form. This powder is added with equal quantities of 'śuddha gandhaka' (bali), 'śuddha manaḥśilā' (rogaśilā), 'śuddha hiṅgula' and triturated to obtain a homogenous mixture.

This mixture is added with required quantity of 'nimbū swarasa' and triturated thoroughly for seven days. Later the 'cakrikās' (pellets) of even size and shape are prepared, dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'.

This entire procedure and the 'gajapuṭa' is repeated for 8 times to obtain appropriately prepared, pale white 'māṇikya bhasma'. Later it is stored in suitable airtight container for further therapeutic use.

**Bhasma colour:** Pale white.

### Māṇikya piṣṭi:

Śuddha māṇikya is taken in a clean khalva yantra and triturated to obtain it in fine powder form. It is added with desired quantity of 'gulāba jala' (rose water) or 'ketakī arka' (distillate of Pandanus odorotissimus) and triturated thoroughly for a day to obtain very fine pink coloured powder. It is later stored in suitable airtight container as 'māṇikya piṣṭi'.

### Māṇikya bhasma- properties:

माणिक्यं सुमृतं मेध्यं मधुरं तु रसायनम् । दीपनं वृष्यमायुष्यं वातपित्तहरं परम् ।।
कफप्रशमनं स्निग्धं क्षयरोगनिषूदनम् । वाजीकरणमत्यन्तं ध्वजभङ्गहरं मतम् ।। (R. T. 23/57-58)

The properly prepared 'māṇikya bhasma' is 'medhya' (intellect promoter); it possesses madhura rasa and 'rasāyana' property. It is a good appetizer and 'aphrodisiac'. Its judicious use provides 'longevity'.

It mitigates vāta, pitta and kapha doṣa. It possesses 'snigdha' guṇa and is indicated in 'kṣaya roga'. As it is aphrodisiac, it corrects the erectile dysfunction in male. Another reference below is supportive of the above reference;

माणिक्यं दीपनं वृष्यं कफवातक्षयार्तिनुत् । (R. R. S. 4/12)

### Māṇikya bhasma- dosage:

आरभ्य गुञ्जापादांशात् गुञ्जार्द्धप्रमितं मृतम् । माणिक्यं योजयेद्धीमान् बलकालाद्यपेक्षया ।।
(R. T. 23/59)

Quarter rattī to half rattī (31 to 62 mgs) is the general dose of 'māṇikya bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

Adjuvant: Honey and butter.

### Māṇikya- compound formulations:

1. Maṇi parpaṭī
2. Brāhmī vaṭī
3. Jawāharamoharā vaṭī
4. Māṇikya mihirodaya rasāyana
5. Navaratna rājamṛgāṅka rasa

## 2. MUKTĀ

(Pearl)

**Pearl- general information:**

Muktā (pearl) is an organic gem. Chemically it is 'calcium carbonate' ($CaCO_3$) with hardness of 2.5 to 3.5 and specific gravity of 2.67-2.75. Pearl is a hard object produced within the soft tissue (specifically the mantle) of a living shelled 'mollusk'. Just like the shell of a mollusk, a pearl is made up of 'calcium carbonate' in minute crystalline form, which has been deposited in concentric layers.

The ideal pearl is perfectly round and smooth, but many other shapes of pearls (baroque pearls) occur. The finest quality natural pearls have been highly valued as gemstones and objects of beauty for many centuries and because of this, the word pearl has become a metaphor for something very rare, fine, admirable, and valuable.

**Physical properties:**

The unique luster of pearls depends upon the reflection, refraction, and diffraction of light from the translucent layers. The thinner and more numerous the layers in the pearl, the finer the lustre. The iridescence that pearls display is caused by the overlapping of successive layers, which breaks up light falling on the surface. In addition, pearls (especially cultured freshwater pearls) can be dyed yellow, green, blue, brown, pink, purple, or black. The very best pearls have a 'metallic mirror-like luster'.

Because pearls are made primarily of 'calcium carbonate', they can be dissolved in 'vinegar'. Calcium carbonate is susceptible to even a weak acid solution because the crystals of calcium carbonate react with the acetic acid in the vinegar to form calcium acetate and carbon dioxide.

**Occurrence:**

Pearls are naturally harvested from Indian ocean, red sea and the Persian Gulf since centuries. China and the Japan are the countries that cultivate both freshwater and salt-water pearls.

**Muktā- synonyms:**

मुक्ता मुक्ताफलञ्चैव मौक्तिकं मौक्तिकेयकम् । शुक्तिजं शौक्तिकेयञ्च शशिरत्नं शशिप्रियम् ॥
(R. T. 23/63)

Muktāpahala, mouktika, mouktikeyaka, śuktija, śouktikeya, śaśiratna and śaśipriya; are the synonymous words used for 'muktā' in classics.

dr.keshav_raj

## Muktā (pearl)- brief history:

Since ages we find the references of 'gemstones' in Indian history. Muktā (pearl) has lured people of all centuries. We find the references of 'muktā' in 'Śrīmadbhāgavata', the stories of 'Mahābhārata' and in the 'Bṛhat Saṁhitā'.

From the period of 'Saṁhitā', the therapeutic use of 'muktā' was thought about. Later with development of 'Rasaśāstra', the purification, incineration, piṣṭi preparation and the therapeutic utility of all gemstones was in practice.

## Mukṭā- types:

> शुक्तिः शङ्खो गजः क्रोडः फणी मत्स्यश्च दर्दुरः । वेणुश्चाष्टौ समाख्याताः सुज्ञैर्मौक्तिकयोनयः ।।
>
> (Āy. Pra. 5/13)

(I) Eight types of muktā are mentioned in classics depending on their origin as mentioned below: however, only first variety 'śukti muktā' or 'muktā śukti' is practically in use.

1. Śukti muktā (from cowry)
2. Śaṅkha muktā (from conch)
3. Gaja muktā (from elephant)
4. Kroḍa muktā (from swine)
5. Phaṇi muktā (from snake)
6. Matsya muktā (from fish)
7. Dardura muktā (from frog)
8. Veṇu muktā (from bamboo)

(II) Two types depending on the source;

1. Natural pearl (prākṛta muktā)
2. Cultured pearl (samvardhita muktā)
    - i. Naturally cultured
    - ii. Prepared from glass or plastic

## Muktā- grāhya lakṣaṇa:

> ह्लादि श्वेतं लघु स्निग्धं रश्मिवन्निर्मलं महत् । ख्यातं तोयप्रभं वृत्तं मौक्तिकं नवधा शुभम् ।।
>
> (R. R. S. 4/13)

The 'muktā' (pearl) which has the pleasing radiance (hlādi or āhlādana); which is śweta (white), laghu (light weighted), snigdha, as bright as sun rays, crystal clean and bigger in size; which is filled with water and which possesses round body; such a sample of 'muktā' with above said nine characters is considered fit and selected for pharmaceutical purposes.

### Muktā- test of genuineness:

By rubbed in husk or by dipping in cow's urine, there should not be any loss in the shine of pearl (muktā). Such a sample is believed to be a genuine natural pearl.

### Muktā- lifespan:

Though the gemstones of mineral origin are eternal, muktā (pearl) has limited lifespan (and also vidruma-coral). After few years, it grows old and eventually loses its characters.

न जरां यान्ति रत्नानि मौक्तिकं विद्रुमं विना । (Ratnadhātu Vijñāna)

### Muktā- agrāhya lakṣaṇa:

दीर्घं पार्श्वकृशं रूक्षं त्र्यस्रं श्यामञ्च सव्रणम् । हतप्रभं क्षुद्रकायं मौक्तिकं हेयमीरितम् ।।

(R. T. 23/66)

The 'muktā' which has long uneven body and thin edges, which is rough, which possesses many angles, which has blackish shade and aberrations; which has less or no radiance and which is in the form of small particles; such a sample of 'muktā' is considered unfit for therapeutic purposes and is rejected as 'agrāhya muktā'.

### Muktā śodhana- 1st method:

जयन्तीस्वरसेनेह दोलायन्त्रे विधानतः । यामैकं सततं स्वित्रं मौक्तिकं शुद्धिमाप्नुयात् ।।

(R. T. 23/67)

The roughly pounded 'muktā' is tied in a 'poṭṭalī' and subjected for 3 hours (one yāma) of 'swedana' in 'dolāyantra' by keeping 'jayantī swarasa' as liquid media. Later the drug is dried and stored in airtight container as 'śuddha muktā' for further pharmaceutical use.

### Muktā śodhana- 2nd method:

अगस्त्यद्रवयोगेन यामं स्वित्रमनारतम् । दोलायन्त्रे पोट्टलीस्थं शुद्धिमायाति मौक्तिकम् ।।

(R. T. 23/68)

The roughly pounded 'muktā' is tied in a 'poṭṭalī' and subjected for 3 hours (one yāma) of 'swedana' in 'dolāyantra' by keeping 'agastya patra swarasa' as liquid media. Later the drug is dried and stored in airtight container as 'śuddha muktā' for further pharmaceutical use.

### Muktā śodhana- 3rd method:

सुराप्रदीपवह्निना शरावगं तु मौक्तिकम् । सुधोदकेन पाचितं विशुद्धिमेत्यनुत्तमाम् ।। (R. T. 23/69)

The required quantity of 'muktā' is taken in a clean glass beaker placed over tripod stand. It is added with enough quantity of 'sudhā jala' (lime water).

Now an ignited spirit lamp is placed below the tripod stand and the content in the beaker is boiled for 2 to 3 hours. Later, when cool on its own, the drug is collected, dried and stored as 'śuddha muktā' for further pharmaceutical use.

**Muktā māraṇa- 1st method:**

विमलं मौक्तिकं गव्यपयसा परिपेषितम् । त्रिधा लघुपुटे पक्वं मृतं स्याच्छशिसुन्दरम् ।।
(R. T. 23/70)

Required quantity of 'śuddha muktā' is taken in a clean khalva yantra. It is carefully pounded and triturated to bring it in fine powder form. This powder is added with equal quantities of 'godugdha', triturated thoroughly and later dried under hot sun.

The dry powder obtained is enclosed in 'śarāva sampuṭa' and subjected for one 'laghupuṭa'. This entire procedure is repeated for 3 times to obtain appropriately prepared 'muktā bhasma', which will be as bright as full moon. Later it is stored in suitable airtight container for further therapeutic use.

**Muktā māraṇa- 2nd method:**

मुक्ताफलन्तु तरुणीपरिस्रुतजलान्वितम् । पिष्टं त्रिवारं पुटितं मृतिमाप्नोत्यनुत्तमाम् ।। (R. T. 23/71)

Required quantity of 'śuddha muktā' is taken in a clean khalva yantra. It is carefully pounded and triturated to bring it in fine powder form. This powder is added with equal quantities of 'gulāba jala' (taraṇī-parisṛta jala), triturated thoroughly and later dried under hot sun.

The dry powder obtained is enclosed in 'śarāva sampuṭa' and subjected for one 'laghupuṭa'. This entire procedure is repeated for 3 times to obtain appropriately prepared 'muktā bhasma'. Later it is stored in suitable airtight container for further therapeutic use.

**Bhasma colour:** Bright white.

**Muktā piṣṭi:**

Śuddha muktā is taken in a clean khalva yantra and triturated to obtain it in fine powder form. It is added with desired quantity of 'gulāba jala' (rose water) and triturated thoroughly for 3 days to obtain very fine white coloured powder with rose fragrance.

It is later stored in suitable airtight container as 'muktā piṣṭi'. It is therapeutically more used in comparison with 'muktā bhasma'.

### Muktā bhasma- properties:

मौक्तिकं वृष्यमायुष्यं मधुरं शिशिरं परम् । दीपनं दाहशमनं नेत्र्यं वर्ण्यं च कीर्तितम् ।।
जीर्णज्वरप्रशमनं त्वस्थिदन्तविवर्द्धनम् । हृद्यं मेहहरं मेध्यं दन्तोद्भेदज्वरापहम् ।।
मौक्तिकं सुशिशिरं क्षयापहं श्वासकासपरिकोपनाशनम् ।
अस्थिशोषशमनं विषापहं देहवीर्यबलबुद्धिवर्धनम् ।।

(R. T. 23/72-74)

Properly prepared 'muktā bhasma' is a good aphrodisiac and provides longevity. It possesses madhura rasa and śīta vīrya. It improves the appetite, brings down the 'burning sensation' in limbs and body, improves the eyesight and enhances the skin radiance.

It is useful in jīrṇa-jwara, strengthens bones and teeth, strengthens cardiac muscles and is indicated in prameha roga. It improves the intellect and cures the fever during teething time.

It is indicated in kṣaya roga, śwāsa, kāsa and asthi-śoṣa. It nullifies the influence of poisons over the body. It is aphrodisiac; it improves the physical strength and intellect.

### Muktā bhasma- dosage:

आरभ्य गुञ्जापादांशाद् गुञ्जैकप्रमितं मृतम् । मौक्तिकं विनियुञ्जीत बलकालाद्यपेक्षया ।।

(R. T. 23/75)

Quarter rattī to one rattī (31 to 125 mgs) is the general dose of 'muktā bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

Adjuvant: Honey, butter, cream or any other suitable medicine.

### Muktā bhasma- compound formulations:

1. Makradhwaja rasa
2. Trailokyacintāmaṇī rasa
3. Grahaṇīkapāṭa rasa
4. Muktā-pañcāmṛta rasāyana
5. Hiraṇyagarbha poṭṭalī
6. Vasantamālatī rasa
7. Viṣamajwarāntaka louha
8. Puṭapakwa-viṣamajwarāntaka louha

## 3. PRAVĀLA (VIDRUMA)

(Coral)

### Pravāla (Coral)- introduction:

**Corals** (Pravāla) are marine animals in class Anthozoa of phylum Cnidaria typically living in compact colonies of many identical individual "polyps". The group includes the important reef builders that inhabit 'tropical oceans' and secrete 'calcium carbonate' ($CaCO_3$) to form a hard skeleton.

A coral "head" is a colony of myriad genetically identical polyps. Each polyp is a spineless animal typically only a few millimeters in diameter and a few centimeters in length. A set of tentacles surround a central mouth opening. An exoskeleton is excreted near the base. Over many generations, the colony thus creates a large skeleton that is characteristic of the species. Individual heads grow by asexual reproduction of polyps. Corals also breed sexually by spawning—polyps of the same species release gametes simultaneously over a period of one to several nights around a full moon.

Although corals can catch small fish and plankton, using stinging cells on their tentacles, most corals obtain the majority of their energy and nutrients from photosynthetic unicellular algae called zooxanthellae that live within the coral's tissue.

Such corals require sunlight and grow in clear, shallow water, typically at depths shallower than 60 meters (200 ft). Corals can be major contributors to the physical structure of the coral reefs that develop in tropical and subtropical waters, such as the enormous Great Barrier Reef off the coast of Queensland, Australia.

Other corals do not have associated algae and can live in much deeper water, with the cold-water genus *Lophelia* surviving as deep as 3,000 meters (9,800 ft). Examples live on the Darwin Mounds located north-west of Cape Wrath, Scotland. Corals have also been found off the coast of the U.S. in Washington State and the Aleutian Islands in Alaska.

Note: Coral's many colors give it appeal for necklaces and other jewellery. Intensely **'red coral'** is prized as a gemstone. Sometimes called 'fire coral', it is not the same as fire coral. Red coral is very rare because of 'overharvesting'.

**Pravāla (vidruma)- synonyms:**

> प्रवालक प्रवालश्च भौमरत्नश्च विद्रुमम् । अब्धिजन्तुविशेषोत्थं तदेव परिकीर्तितम् ।।
>
> (R. T. 23/128)

Pravālaka, pravāla, bhoumaratna, vidruma, abdhi-jantu-viśeṣottha; all these are the synonymous words used in the classics for 'coral'.

**Pravāla (vidruma)- brief history:**

Since ages we find the references of 'gemstones' in Indian history. Pravāla (coral) has lured people of all centuries. We find the references of 'muktā' in 'Śrīmadbhāgavata' and the stories of 'Mahābhārata'.

From the period of 'Saṁhitā', the therapeutic use of 'pravāla' was thought about. Later with development of 'Rasaśāstra', the purification, incineration, piṣṭi preparation and the therapeutic utility of all gemstones was in practice.

**Pravāla- types:**

(I) Depending on colour 'pravāla' is of four types; 1. White 2. Grey 3. Black and 4. Red; out of these red variety is considered best.

(II) Depending on the part used, 'pravāla' is classified as; 1. Pravāla mūla and 2. Pravala śākhā; both these parts possess similar properties.

**Pravāla (vidruma)- grāhya swarūpa:**

आरक्तमञ्जुलच्छायं स्निग्धं वृत्तञ्च निर्व्रणम् । दीर्घस्थूलं गुरु दृढं ग्राह्यं विद्रुममुच्यते ।।

(R. T. 23/129)

The pravāla (coral), which possesses the radiance of deep red colour, which is smooth and soft, which has long and bulky branch, which has no aberrations and which is heavy and strong; such a sample of 'pravāla' is considered fit and selected for therapeutic purposes.

**Pravāla- agrāhya swarūpa:**

पाण्डुरं सव्रणं रूक्षं सशिरं लघु घूसरम् । कृष्णं सूक्ष्मं सुमसृणं हेयं विद्रुममीरितम् ।।

(R. T. 23/130)

The pravāla (coral), which possesses pale colour, which has aberrations over its body, which is dry, which has many head like structures, which is light weighted, which has blackish slender branches, or the one which is very much lustrous; such a sample of 'pravāla' is considered unfit and rejected for therapeutic purposes.

**Pravāla (vidruma) śodhana- 1st method:**

जयन्त्याः स्वरसेनेह दोलायन्त्रे तु विद्रुमम् । यामैकं सुपरिस्विन्नं शुद्धिमायात्यनुत्तमाम् ।।

(R. T. 23/131)

The roughly pounded 'pravāla' (coral) is tied in a 'poṭṭalī' and subjected for 3 hours (one yāma) of 'swedana' in 'dolāyantra' by keeping 'jayantī swarasa' as liquid media. Later the drug is washed, dried and stored in airtight container as 'śuddha pravāla' for further pharmaceutical use.

**Pravāla (vidruma) śodhana- 2nd method:**

सर्जिकाक्षारसंयुक्ते सलिले परिपाचितम् । यामैकेन प्रवालं तु शुद्धिमायात्यनुत्तमाम् ।।

(R. T. 23/132)

The roughly pounded 'pravāla' (coral) is tied in a 'poṭṭalī' and subjected for 3 hours (one yāma) of 'swedana' in 'dolāyantra' by keeping 'sarjakṣāra jala' as liquid media. Later the drug is washed, dried and stored in airtight container as 'śuddha pravāla' for further pharmaceutical use.

**Pravāla (vidruma) śodhana- 3rd method:**

तण्डुलीयद्रवेणेह दोलायन्त्रे तु यामकम् । प्रवालकं परिस्वित्रं शुद्धिमायात्यनुत्तमाम् ।।
(R. T. 23/133)

The roughly pounded 'pravāla' (coral) is tied in a 'poṭṭalī' and subjected for 3 hours (one yāma) of 'swedana' in 'dolāyantra' by keeping 'taṇḍulīya jala' as liquid media. Later the drug is washed, dried and stored in airtight container as 'śuddha pravāla' for further pharmaceutical use.

**Pravāla (vidruma) māraṇa- 1st method:**

विशोधितं विद्रुमं तु श्लक्ष्णचूर्णं तु कारयेत् । कन्याम्भसाऽथ सम्पेष्य शोषयेत् कृतचक्रिकम् ।।
सम्पुटस्थं ततः कृत्वा त्रिवारं पुटयेद्भिषक् । एवं पुटत्रयैर्भस्म जायते शशिसुन्दरम् ।।
(R. T. 23/134-135)

Required quantity of 'śuddha pravāla' is taken in a clean khalva yantra and triturated to obtain it in the form of fine powder. This powder is added with required quantity of 'ghṛtakumārī swarasa' and triturated thoroughly to prepare the cakrikās (pellets) of even size and shape.

These pellets are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'puṭa' (laghu puṭa). All this process is repeated three times to obtain clean, bright moon like 'white bhasma' of 'pravāla'. It is later stored in suitable airtight container for further pharmaceutical as well as therapeutic use.

**Pravāla (vidruma) māraṇa- 2nd method:**

विद्रुमं गव्यदुग्धेन संपेष्य कृतचक्रिकम् । म्रियते पुटितं भस्म जायतेऽतिमनोहरम् ।।
(R. T. 23/136)

Required quantity of 'śuddha pravāla' is taken in a clean khalva yantra and triturated to obtain it in the form of fine powder. This powder is added with required quantity of 'godugdha' (cow's milk) and triturated thoroughly to prepare the cakrikās (pellets) of even size and shape.

These pellets are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'puṭa' (laghu puṭa). All this process is repeated three times to obtain clean, white bhasma of 'pravāla'. It is later stored in suitable airtight container for further pharmaceutical as well as therapeutic use.

### Pravāla (vidruma) māraṇa- 3rd method:

जयन्त्याः स्वरसेनेह सम्पेष्य कृतचक्रिकम् । त्रिवारं पुटितं सम्यग् विद्रुमं म्रियते ध्रुवम् ।।

(R. T. 23/137)

Required quantity of 'śuddha pravāla' is taken in a clean khalva yantra and triturated to obtain it in the form of fine powder. This powder is added with required quantity of 'jayantī swarasa' and triturated thoroughly to prepare the cakrikās (pellets) of even size and shape.

These pellets are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'puṭa' (laghu puṭa). All this process is repeated three times to obtain clean, white bhasma of 'pravāla'. It is later stored in suitable airtight container for further pharmaceutical as well as therapeutic use.

### Pravāla (vidruma) māraṇa- 4th method:

पिष्टं वरीरसेनेह प्रवालं कृतचक्रिकम् । म्रियते पुटितं वह्नौ भस्म स्यात् सुमनोहरम् ।।

(R. T. 23/138)

Required quantity of 'śuddha pravāla' is taken in a clean khalva yantra and triturated to obtain it in the form of fine powder. This powder is added with required quantity of 'śatāvarī swarasa' and triturated thoroughly to prepare the cakrikās (pellets) of even size and shape.

These pellets are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'puṭa' (laghu puṭa). All this process is repeated three times to obtain clean, white bhasma of 'pravāla'. It is later stored in suitable airtight container for further pharmaceutical as well as therapeutic use.

**Bhasma colour:** White.

### Pravāla piṣṭi:

Śuddha pravāla is taken in a clean khalva yantra and triturated to obtain it in fine powder form. It is added with desired quantity of 'gulāba jala' (rose water) and triturated thoroughly for 3 days to obtain very fine powder of pale rose red colour with rose fragrance. It is later stored in suitable airtight container as 'pravāla piṣṭi'.

### Pravāla bhasma- properties:

विद्रुमं सुमृतं क्षारं मधुरं लघु शीतलम् । दीपनं पाचनं चैव दृष्टिरोगनिपूदनम् ।।
त्रिदोपशमनं वल्यं विशेपात्कफवातनुत् । क्षयकासहरं चैव रक्तपित्तप्रणाशनम् ।।
स्वेदातिनिर्गमहरं रात्रिस्वेदहरं परम् । विपघ्नं भूतशमनं वीर्यवर्णविवर्द्धनम् ।। (R. T. 23/139-141)

Properly prepared 'pravāla bhasma' possesses 'kṣārīya' and 'madhura rasa';

and 'laghu', 'śīta' guṇa. It is a good appetizer and digestive. It is useful in all types of eye diseases. It mitigates all the three vitiated doṣa. Its use improves the physical strength and is especially useful in kaphaja and vātaja roga.

It is indicated in kṣaya roga, kāsa, raktapitta, excessive sweating and night sweats. It nullifies the influence of poisons within the body. It kills many infectious organisms in the body. Its judicious use for internal administration improves the virility and skin complexion.

**Pravāla bhasma- dosage:**

> गुञ्जार्धतः समारभ्य गुञ्जाद्वयमितं परम् । विद्रुमं विनियुञ्जीत बलकालाद्यपेक्षया ।।
>
> (R. T. 23/142)

Quarter rattī to two rattī (31 to 250 mgs) is the general dose of 'pravāla bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

Adjuvant: Butter, cream and honey.

**Pravāla bhasma- compound formulations:**

1. Pravālapañcāmṛta rasa
2. Kastūrībhairava rasa
3. Ratnagarbha poṭṭalī
4. Sarvāṅga sundara rasa
5. Muktāpañcāmṛta rasa
6. Puṭapakwaviṣamajwarāntaka rasa
7. Apūrvamālinīvasanta rasa

## 4. TĀRKṢYA

(Emerald)

**Tārkṣya (emerald)- general information:**

**Emerald** is a variety of the mineral beryl (beryllium mineral) with chemical formula $Be_3Al_2(SiO_3)_6$. It also contains aluminium and silicon. It is colored green by trace amounts of 'chromium' and sometimes 'vanadium'.

This beryllium mineral has a hardness of 7.5-8 on the 10 point Mohs scale of mineral hardness. Its refractive index is 1.57. Most emeralds exhibit poor resistance to breakage and they fade away when exposed to heat.

**Occurrence:**

Emeralds in antiquity were mined by the Egyptians and in India and Austria. Emeralds are also found in other countries, such as Afghanistan, Australia, Austria, Bulgaria, Cambodia, Canada, China, Egypt, Ethiopia, Germany, India, Italy, Kazakhstan, Madagascar, Mozambique, Namibia, Nigeria, Norway, Pakistan, Russia, Somalia, South Africa, Spain, Switzerland, Tanzania, United States, Zambia and Zimbabwe.

**Tārkṣya- synonyms:**

गारुत्मतं मरकतं तार्क्ष्यं गारुडसंज्ञकम् । बुधरत्नं रौहिणेयं हरिद्रत्नश्च तन्मतम् ।। (R. T. 23/104)

Gārutmata, marakata, gāruḍa maṇī, budha-ratna, gouhiṇeya and haridratna; all these are the synonymous words used in the classics for 'tārkṣya' (emerald). It is called 'pannā' in Hindi.

**Tārkṣya (emerald)- brief history:**

Since ages we find the references of 'gemstones' in Indian history. Tārkṣya (emerald) has lured people of all centuries. We find the references of 'emerald' in 'Śrīmadbhāgavata', the stories of 'Mahābhārata' and in the 'Bṛhat Saṁhitā'.

From the period of 'Saṁhitā', the therapeutic use of 'emerald' was thought about. Later with development of 'Rasaśāstra', the purification, incineration, piṣṭi preparation and the therapeutic utility of all gemstones was in practice.

**Tārkṣya- types:**

No types of 'emerald' are mentioned in 'rasa grantha'. However, depending on colours in which the gemstone comes, it can be divided into three varieties;

1. Green emerald (Best variety)
2. Blue emerald (Medium variety)
3. White emerald (Common variety)

**Tārkṣya- grāhya swarūpa:**

सच्छायं मसृणं स्वच्छं गुरु स्निग्धञ्च कोमलम् । अव्यङ्गञ्च हरिद्वर्णं जात्यं मरकतं मतम् ।।
(R. T. 23/105)

The 'tārkṣya', which is radiant, lustrous, crystal clear, heavy, soft and smooth to touch, even and beautiful bodied and yellowish coloured; such a sample of 'tārkṣya' (emerald) is considered fit and is selected for the pharmaceutical purposes.

**Tārkṣya- agrāhya swarūpa:**

रुक्षन्तु विगतच्छायं विकृताङ्गं खरं लघु । सत्रासं चातिमलिनं हेयं मरकतं मतम् ।। (R. T. 23/106)

The 'tārkṣya', which is dry bodied, non-radiant, uneven bodied, rough surfaced, light weighted, which has different colours (trāsa) and which is unclean from within; such a sample of 'tārkṣya' (emerald) is considered unfit and is rejected for the pharmaceutical purposes.

## Tārkṣya- śodhana:

सुरभीपयसा यामं दोलायन्त्रे विधानतः । विपाचितं मरकतं विशुद्ध्यति सुनिश्चितम् ।। (R. T. 23/107)

The roughly pounded 'tārkṣya' (emerald) is tied in a 'poṭṭalī' and subjected for 3 hours (one yāma) of 'swedana' in 'dolāyantra' by keeping 'godugdha' (cow's milk) as liquid media. Later the drug is washed, dried and stored in airtight container as 'śuddha tārkṣya' for further pharmaceutical use.

## Tārkṣya sāmānya māraṇa:

लकुचद्रावसंपिष्टैः शिलागन्धकतालकैः । वज्रं विनाऽन्यरत्नानि म्रियन्तेऽष्टपुटैः खलुः ।।

(R. R. S. 4/66)

1. The fine powders of any of the individual śuddha ratna (except vajra) - 1 part; 2. Śuddha manaḥśilā - 1 part; 3. Śuddha gandhaka - 1 part; and 4. Śuddha haratāla - 1 part; all these are taken in a clean khalva yantra and subjected for 3 bhāvanās with 'lakuca swarasa'.

Later cakrikās are prepared, dried and enclosed in śarāva sampuṭa. This sampuṭa is subjected for one gajapuṭa. This whole process is repeated for 8 times to obtain properly prepared bhasma of six gemstones of mineral origin except vajra.

## Tārkṣya viśeṣa māraṇa:

माणिक्यमारणोद्दिष्टविधिध्यामतियत्नतः । अष्टधा पुटितं तार्क्ष्यं म्रियतेऽत्र न संशयः ।।

(R. T. 23/108)

The methods followed for incineration of 'tārkṣya' are same as that of the two methods (1st and 2nd method) followed to obtain 'māṇikya bhasma' using eight 'puṭa'; (find above under the relevant heading).

**Bhasma colour:** White.

## Tārkṣya piṣṭi:

Śuddha tārkṣya is taken in a clean khalva yantra and triturated to obtain it in fine powder form. It is added with desired quantity of 'gulāba jala' (rose water) and triturated thoroughly for 3 days to obtain very fine powder or greenish white colour with rose fragrance. It is later stored in suitable airtight container as 'tārkṣya piṣṭi'.

## Tārkṣya bhasma- properties:

मृतं मरकतं बल्यं विषघ्नं वह्निदीपनम् । ओजोविवर्द्धनं वृष्यं पाण्डुशोफनिषूदनम् ।।
श्वासच्छर्दिप्रशमनं गुदजामयनाशनम् । समाख्यातं विशेषेण सन्निपातनिबर्हणम् ।।

(R. T. 23/109-110)

Properly prepared 'tārkṣya bhasma' when used judiciously for internal administration, provides physical strength, nullifies the effects of 'poison' within the body, improves the appetite and enhances the 'oja'. It is aphrodisiac and is indicated in pāṇḍu roga, śopha (oedema), śwāsa, chardi, diseases of anal region and in sannipātaja jwara.

- Another reference is as below;

> मरकतं विषघ्नं हि शीतलं मधुरं रसे । अम्लपित्तहरं रुच्यं पुष्टिदं भूतनाशनम् ।। (Āy. Pra. 5/105)

**Tārkṣya bhasma- dosage:**

> आरभ्य गुञ्जापादांशाद् गुञ्जैकप्रमितं परम् । मृतं मरकतं युञ्जात् बलकालाद्यपेक्षया ।।
>
> (R. T. 23/111)

Quarter rattī to one rattī (31 to 125 mgs) is the general dose of 'tārkṣya bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

**Tārkṣya bhasma- compound formulations:**

1. Navaratnarājamṛgāṅka rasa
2. Maṇi parpaṭī
3. Javāharmoharā vaṭī
4. Ratnabhāgottara rasa

## 5. PUṢPARĀGA

(Topaz)

**Puṣparāga (topaz)- general information:**

**Topaz** is a silicate mineral of aluminium and fluorine with the chemical formula $Al_2SiO_4(F,OH)_2$. Its hardness is 4 and refractive index of 1.76 to 1.77. However, presently in India, 'yellow sapphire' is marketed as 'Topaz'. This mineral crystallizes in the orthorhombic system, and its crystals are mostly prismatic.

Pure topaz is colourless and transparent but is usually tinted by impurities. Therefore, it comes in wide range of colours, such as wine (deep red colour), yellow, pale grey, reddish-orange or blue brown. It can also be made white, pale green, blue, gold, pink (rare), reddish-yellow or opaque to transparent/translucent.

*Imperial topaz* is yellow, pink (rare, if natural) or pink-orange. Brazilian Imperial Topaz can often have a bright yellow to deep golden brown hue, sometimes even violet. Many brown or pale topazes are treated to make them bright yellow, gold, pink or violet colored. Some imperial topaz stones can fade on exposure to sunlight for an extended period of time.

Topaz is commonly associated with silicic igneous rocks of the granite and rhyolite type. It typically crystallizes in granitic pegmatites or in vapour cavities in rhyolite lava flows like those at Topaz Mountain in western Utah.

### Occurrence:

It can be found with fluorite and cassiterite in various areas including the Ural and Ilmen mountains of Russia, in Afghanistan, Sri Lanka, Czech Republic, Germany, Norway, Pakistan, Italy, Sweden, Japan, Brazil, Mexico, Flinders Island, Australia, Nigeria and the United States.

### Puṣparāga- synonyms:

पुष्पराजः पुष्परागः पीतरक्ताह्वयस्तथा । गुरुरत्नं पीतमणिः स एव गुरुवल्लभः ॥ (R. T. 23/87)

Puṣparāja, pītarakta, guru (Bṛhaspati) ratna, pītamaṇī and guruvallabha; all these are the synonymous words used in the classics for 'puṣparāga' (Topaz).

### Puṣparāga (topaz)- brief history:

Since ages, we find the references of 'gemstones' in Indian history. Puṣparāja (topaz) has lured people of all centuries. We find the references of 'topaz' in 'Śrīmadbhāgavata', the stories of 'Mahābhārata' and in the 'Bṛhat Saṁhitā'.

From the period of 'Saṁhitā', the therapeutic use of 'emerald' was thought about. Later with development of 'Rasaśāstra', the purification, incineration, piṣṭi preparation and the therapeutic utility of all gemstones was in practice.

### Puṣparāga (topaz)- types:

No types of 'emerald' are mentioned in 'rasa grantha'. However, depending on colours in which the gemstone comes, it can be divided into four varieties; 1. Yellow 2. Pale white 3. White and 4. Red.

As per the reference of 'Yuktikalpataru', Topaz is of two types; 1. Padmarāgavat and 2. Marakatavat.

### Puṣparāga- grāhya lakṣaṇa:

स्निग्धं समं सुमसृणं तु सुवर्णवर्णं स्वच्छं परं सुविमलं तु सुवृत्तगात्रम् ।
यत्कर्णिकारकुसुमप्रभमुज्ज्वलञ्च जात्यं तदेव गदितं खलु पुष्पराजम् ॥
निकषोपलसंघृष्टं वर्णं पुष्णाति यन्निजम् । पुष्पराजन्तु तज्जात्यं मतं रत्नपरीक्षकैः ॥ (R.T. 23/88-89)

The 'puṣparāga' (Topaz) which is soft, even and round bodied, lustrous with golden shade and resembling the brightness and colour of 'āragwadha puṣpa'. When rubbed over and even surface, its colour brightens. Such a sample of 'puṣparāga' is considered as the 'grāhya variety' for pharmaceutical purposes.

dr.keshav-raj

### Puṣparāga- agrāhya lakṣaṇa:

श्यामलं निष्प्रभं कर्कशं द्व्यक्षकं कृष्णबिन्दुङ्कितं शर्कराङ्गप्रभम् ।
उन्नतं त्वानत यच्च रुक्षंपरं पुष्पराजं मतं तत्तु हेयं बुधैः ।। (R. T. 23/90)

The 'puṣparāga' (Topaz) which has blackish shade, lustreless, rough surfaced with aberrations, having eye like two bigger black spots, like the bolus of sand, uneven bodied and dry; is considered as the 'grāhya variety' of 'puṣparāga'. It should not be selected for any medicinal use.

### Puṣparāga śodhana:

कुलत्थक्वथितोपेतैः काञ्जिकैः स्वेदितं समम् । दोलायन्त्रे पुष्पराजं यामैकेन विशुद्ध्यति ।।

(R. T. 23/91)

The roughly pounded 'puṣparāga' is tied in a 'poṭṭalī' and subjected for 3 hours (one yāma) of 'swedana' in 'dolāyantra' by keeping 'kulattha kwātha' and 'kāñjī' (both taken in equal quantities) as liquid media. Later the drug is dried and stored in airtight container as 'śuddha puṣparāga' for further pharmaceutical use.

### Puṣparāga sāmānya māraṇa:

लकुचद्रावसंपिष्टैः शिलागन्धकतालकैः । वज्रं विनान्यरत्नानि म्रियतेऽष्टपुटैः खलु ।।

(R. R. S. 4/66)

1. The fine powders of any of the individual śuddha ratna (except vajra) - 1 part; 2. Śuddha manaḥśilā - 1 part; 3. Śuddha gandhaka - 1 part; and 4. Śuddha haratāla - 1 part; all these are taken in a clean khalva yantra and subjected for 3 bhāvanās with 'lakuca swarasa'.

Later cakrikās are prepared, dried and enclosed in śarāva sampuṭa. This sampuṭa is subjected for one gajapuṭa. This whole process is repeated for 8 times to obtain properly prepared bhasma of six gemstones of mineral origin except vajra.

### Puṣparāga viśeṣa māraṇa:

माणिक्यमारणोद्दिष्टविधिध्यामतियत्नतः । मारयेत्पुष्पराजन्तु रसतन्त्रविचक्षणः ।। (R. T. 23/92)

The methods followed for incineration of 'puṣparāga' are same as that of the two methods (1st and 2nd method) followed to obtain 'māṇikya bhasma' (find above under the relevant heading).

**Bhasma colour:** White.

### Puṣparāga piṣṭi:

Śuddha puṣparāga is taken in a clean khalva yantra and triturated to obtain it in fine powder form. It is added with desired quantity of 'gulāba jala' (rose water) and triturated thoroughly for 3 days to obtain very fine pale white coloured powder with rose fragrance. It is later stored in suitable airtight container as 'puṣparāga piṣṭi'.

**Puṣparāga bhasma- properties:**

पुष्पराजन्तु शिशिरं दीपनं पाचनं परम् । कफवातप्रशमनं कुष्ठच्छर्दिनिवर्हणम् ।।
विषघ्नं दाहशमनं गुदजामयनाशनम् । मेध्यं वृंहणमायुष्यं रसज्ञैः परिकीर्तितम् ।। (R. T. 23/93-94)

Puṣparāga bhasma possesses 'śīta' guṇa. It is a good appetizer and digestive. Its judicious use for internal administration mitigates vitiated kapha and vāta doṣa. It is indicated in kuṣṭha and chardi roga. It nullifies the influence of 'viṣa' over body.

It brings down the burning sensation in the body and cures the diseases of anus. It promotes the intellect (medya), improves the body mass (bṛmhaka) and provides longevity (āyu vardhaka).

**Puṣparāga bhasma- dosage:**

आरभ्य गुञ्जापादांशाद् गुञ्जैकप्रमितं परम् । सुमृतं पुष्पराजन्तु प्रयुञ्जीत भिषग्वरः ।। (R. T. 23/95)

Quarter rattī to one rattī (31 to 125 mgs) is the general dose of 'puṣparāga bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

**Puṣparāga bhasma- compound formulations:**

1. Navaratnarājamṛgāṅka rasa
2. Maṇi parpaṭī
3. Ratnabhāgottara rasa

### 6. VAJRA (Bidura)

(Diamond; C)

**Vajra (diamond)- introduction:**

Diamond is an excellent form of carbon (C). In mineralogy, **diamond** (Greek word which means "unbreakable") is an allotrope of carbon, where the carbon atoms are arranged in a variation of the face-centered cubic crystal structure called a diamond lattice. Diamond is less stable than graphite, but the conversion rate from diamond to graphite is negligible at ambient conditions.

Diamond is renowned as a material with superlative physical qualities, most of which originate from the strong covalent bonding between its atoms. In particular, diamond has the highest hardness and thermal conductivity of any bulk material. Those properties determine the major industrial application of diamond in cutting and polishing tools and the scientific applications in diamond knives and diamond anvil cells.

Diamond has remarkable optical characteristics. Because of its extremely rigid lattice, it can be contaminated by very few types of impurities, such as boron and nitrogen. Combined with wide transparency, this results in the clear, colorless appearance of most natural diamonds. Small amounts of defects or impurities (about one per million of lattice atoms) color diamond blue (boron), yellow (nitrogen), brown (lattice defects), green (radiation exposure), purple, pink, orange or red.

Diamond also has relatively high optical dispersion (ability to disperse light of different colors), which results in its characteristic luster. Excellent optical and mechanical properties, combined with efficient marketing, make diamond the most popular gemstone.

**Formation:**

Most natural diamonds are formed at high temperature and pressure at depths of 140 to 190 kilometers (87 to 120 mi) in the Earth mantle. Carbon-containing minerals provide the carbon source, and the growth occurs over periods from 1 billion to 3.3 billion years (25% to 75% of the age of the Earth). Diamonds are brought close to the Earth surface through deep volcanic eruptions by a magma, which cools into igneous rocks known as kimberlites and lamproites.

Diamonds can also be produced synthetically in a high-pressure high-temperature process which approximately simulates the conditions in the Earth mantle.

**Hardness:**

Diamond is the hardest known natural material on the Mohs scale of mineral hardness, where hardness is defined as resistance to scratching and is graded between 1 (softest) and 10 (hardest). Diamond has a hardness of 10 (hardest) on this scale. Diamond's hardness has been known since antiquity, and is the source of its name. However, diamond's hardness depends on its purity, crystalline perfection and orientation.

**Other physical properties:**

It has specific gravity of 3.25. Its refractive index of 2.42, which is very high.

Therefore the diamond is highly lustrous. It is capable of resisting heat but turns black in high temperature. When burnt in presence of oxygen, it releases carbon dioxide ($CO_2$).

**Chemical stability:**

Diamonds are not very reactive. Under room temperature diamonds do not react with any chemical reagents including strong acids and bases. A diamond's surface can only be oxidized a little by just a few oxidants at high temperature (below 1,000$^0$C). Therefore, acids and bases can be used to refine synthetic diamonds.

**Occurrence:**

Earlier to mid-18th century, India and Brazil were main producers of 'diamond'. Later the diamonds were traced in many other countries. Presently the main producers of diamond are; South Africa, Namibia, Australia, USA, USSR, Ghana and Botswana.

**Vajra (hīraka)- synonyms:**

हीरको हीरकं हीरमभेद्यं भिदुरं तथा । कुलिशं वज्रकं वज्रं तथोक्तं भार्गवप्रियम् ।। (R. T. 23/5)

Hīraka, hīra, abheda, bhidura, kuliśa, vajraka, vajra and bhārgava priya; all these are the synonymous words used for 'vajra' (diamond) in the classics.

**Vajra (diamond)- brief history:**

Since ages we find the references of 'gemstones' in Indian history. Vajra (diamond) has lured people of all centuries. We find the references of 'emerald' in 'Śrīmadbhāgavata', the stories of 'Mahābhārata' and in the 'Bṛhat Saṁhitā'.

From the period of 'Saṁhitā', the therapeutic use of 'diamond' was thought about. Later with development of 'Rasaśāstra', the purification, incineration, piṣṭi preparation and the therapeutic utility of all gemstones was in practice.

**Vajra- types:**

(I) Four types depending on the colour;

| | Types | Used for... |
|---|---|---|
| 1 | Śweta vajra | Rejuvenation and all other purposes |
| 2 | Rakta vajra | Therapeutic purposes |
| 3 | Pīta vajra | Body nourishment and commercial purposes |
| 4 | Kṛṣṇa vajra | Therapeutic purposes and rejuvenator |

(II) Three types depending on the gender;

| | Types | Quality |
|---|---|---|
| 1 | Nara vajra | Uttama |
| 2 | Nārī vajra | Madhyama |
| 3 | Napuṁsaka vajra | Adhama |

Note: In above categorization, it is said that the nara, nārī and napuṁsaka vajra should be used in man, women and in impotent respectively for therapeutic purposes. This belief seems completely irrational and unacceptable.

**Vajra- grāhya lakṣaṇa:**

स्निग्धं विद्युद्विभं स्वच्छमलेख्यं च विलेखनम् । तीक्ष्णं षट्कोणमष्टास्रं जात्यं हीरकमुच्यते ।।

(R. T. 23/6)

The 'vajra' (diamond), which is soft to touch (snigdha), lustrous like that of electricity, clean looking, very hard and unbreakable, which can cut the glasses, very sharp looking and which has six angles and eight surfaces; such a sample of 'vajra' is considered the best variety and is selected for pharmaceutical purposes.

**Vajra- agrāhya swarūpa:**

वर्तुलं मलिनं नीलं भूत्याभं स्फुटितं खरम् । सकाकपादं रेखाढ्यं हेयं हीरकमादिशेत् ।।

(R. T. 23/7)

The 'vajra' (diamond) which is round bodied without any angles and surfaces, which is unclean, bluish in colour, with dull radiance, broken, having rough outer body (with impressions like that of crow's claws) and the one with many lines in it; is considered unfit for any of the pharmaceutical purposes.

**Vajra doṣa:** (Āyurveda Prakāśa 5/32-34)

| | Vajra doṣa | Description |
|---|---|---|
| 1 | Bindu doṣa | Round spots of different colours within the body of vajra |
| 2 | Kākapada doṣa | With spots resembling 'kākapada' (claws of a crow) |
| 3 | Yava doṣa | Spots of different colours resembling the shape of wheat |
| 4 | Mala doṣa | Appears unclean from within with many impurities |
| 5 | Rekhā doṣa | With many transverse lines within |

**Vajra (diamond)- test of perfectness:**

यन्त्रिकाषफलके शिलातले घृष्यते न हि निकामघर्षितम् ।
लीलयैव दलयत्यथापरान् तद्वरं भिदुरमीरितं बुधैः ।। (R. T. 23/8)

When the 'diamond' is rubbed hard on to a rough surface, it remains completely unaffected. Instead with its sharp edges, it easily cuts the surfaces (glass, metal etc) on which it is rubbed.

### Vajra śodhana- necessity:

अविशुद्धं मृतं हीरं शीलितं पार्श्ववेदनाम् । कुष्ठं तापं भ्रमादींश्च जनयत्यविलम्बितम् ।। (R. T. 23/9)

Vajra bhasma prepared from impure or improperly purified 'vajra' if administered will cause pārśwa pīḍā (pain in the flanks), kuṣṭha (skin diseases), increase in body temperature, bhrama (giddiness), mūrcchā (syncope) and such other complications. Therefore, it is most essential to purify the diamond before taking it for incineration.

### Vajra śodhana- 1st method:

कुलत्थकोद्रवक्वाथे दोलायन्त्रे विपाचयेत् । व्याघ्रीकन्दगतं वज्रं त्रिदिनं तद्विशुद्ध्यति ।।

(Āy. Pra. 5/77)

Required quantity of 'aśuddha vajra' is tied in a cloth as poṭṭalī and hung in 'dolāyantra' containing 'kulattha kwātha' or 'kodrava' as liquid media. The yantra is placed over intense fire and the drug is subjected for swedana daily for three days.

After 3rd day's swedana, the 'vajra' is collected, washed, dried and stored in suitable airtight container as 'śuddha vajra' for further pharmaceutical use.

### Vajra śodhana- 2nd method:

कुलत्थक्वाथसंयुक्तं हीरं दोलाख्ययन्त्रगम् । स्वित्रं दिनत्रयं यत्नाद्विशिष्टां शुद्धिमाप्नुयात् ।।

(R. T. 23/11)

Required quantity of 'aśuddha vajra' is tied in a cloth as poṭṭalī and hung in 'dolāyantra' containing 'kulattha kwātha' as liquid media. The yantra is placed over intense fire and the drug is subjected for swedana daily for three days.

After 3rd day's swedana, the 'vajra' is collected, washed, dried and stored in suitable airtight container as 'śuddha vajra' for further pharmaceutical use.

### Vajra śodhana- 3rd method:

हीरकं परिसन्तप्तं सुधाक्षीरे निषेचितम् । शतवारं प्रयत्नेन शुद्धिमाप्नोत्यसंशयम् ।। (R. T. 23/12)

Aśuddha vajra is heated red-hot over intense fire and dipped in enough quantity of 'snuhī kṣīra'. This process of heating and dipping is repeated for 100 times to obtain the 'vajra' purified. Later the drug is collected, washed, dried and stored in suitable airtight container as 'śuddha vajra' for further pharmaceutical use.

**Vajra śodhana- 4th method:**

हीरकं परिसन्तप्तं प्रखरानलयोगतः । शतधा वापितं सूते शुद्धे शुद्धिमवाप्नुयात् ।।
एवं निर्वापितं हीरं चूर्णतामेति सत्वरम् । अनुभूतः प्रकारोऽयं समाख्यातो महोत्तमः ।।

(R. T. 23/13-14)

Aśuddha vajra is heated red-hot over intense fire and dipped in enough quantity of 'śuddha pārada'. This process of heating and dipping is repeated for 100 times to obtain the 'vajra' purified.

After repeating the process of heating and dipping in enough quantity of 'śuddha pārada' for 20 to 30 times, the 'vajra' breaks into pieces. When the process is repeated further, the 'vajra' eventually becomes powdery.

Later the 'vajra cūrṇa' is collected, dried and stored in suitable airtight container as 'śuddha vajra' for further pharmaceutical use. This is one among the trusted 'anubhūta' method of 'vajra śodhana'.

**Vajra māraṇa- 1st method:**

शोधितं हीरकं यत्नतश्चूर्णितं तालकं गन्धकं हिङ्गुलं तन्मितम् ।
माक्षिकं मारितञ्चेह हीरोन्मित राजकोलद्रवेणेह सम्पेषयेत् ।।
पिप्पलोत्थद्रवैर्भावयेत्सप्तधा भावितस्यास्य वै कारयेद् गोलकम् ।
उपलस्याग्निना वारणाख्ये पुटे सम्पुटस्थं ततो पाचयेद्यत्नतः ।।
हीरकं पञ्चतां नैति यावद् भृशं तावदेवं पुटेद्यत्नतः कोविदः ।
माक्षिकं न क्षिपेद्धै द्वितीये पुटे हीरकं पञ्चतामेति सर्वात्मना ।। (R. T. 23/15-17)

One part of 'śuddha vajra' is taken in a clean khalva yantra. It is carefully pounded and triturated to bring it in fine powder form. This powder is added with equal quantities of 'śuddha haratāla', 'śuddha gandhaka', 'śuddha hiṅgula' and 'swarṇa mākṣika bhasma' and triturated to obtain a homogenous mixture.

This mixture is added with required quantity of 'rājakola drava' (bṛhat badara phala rasa) and triturated thoroughly. Later this drug mixture is subjected for seven bhāvanās with 'aśwattha twak kwātha'.

After 7th bhāvanā, a bolus of the drug material is prepared and dried under hot sun. This bolus is enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa' using dry cow dung cakes.

This entire procedure and the 'gajapuṭa' is repeated more than once until appropriate 'vajra bhasma' is formed. However, after first 'puṭa', the obtained drug mixture is added again with all the above said drugs except 'swarṇa mākṣika bhasma'.

Like this in few number of 'gajapuṭa' it is possible to obtain appropriate, white coloured 'vajra bhasma'. As per practical experience, the drug needs 15 gajapuṭa to become the perfect 'vajra bhasma'. Later it is stored in suitable airtight container for further therapeutic use.

### Vajra māraṇa- 2nd method:

हीरकं विमलं सूतं मृतन्तु समभागिकम् । मनःशिला गन्धकञ्च समं दत्त्वा विमर्दयेत् ।।
सम्पुटस्थं तु पुटयेद् वारणाख्ये पुटे भृशम् । तावत्पुटेत्प्रयत्नेन यावन्नायाति पञ्चताम् ।।
द्वितीयादिपुटेष्वत्र सूतं न विनियोजयेत् । एवं चतुर्दशपुटैर्हीरकं म्रियते ध्रुवम् ।।
अनुभूतः प्रकारोऽयं सुगमस्तु प्रकाशितः । एवं मृतं हीरकन्तु वीतशङ्कः प्रयोजयेत् ।।
(R. T. 23/18-21)

One part of 'śuddha vajra' is taken in a clean khalva yantra. It is carefully pounded and triturated to bring it in fine powder form. This powder is added with equal quantities of 'pārada bhasma' (rasasindūra), 'śuddha manaḥśilā' and 'śuddha gandhaka' and triturated to obtain a homogenous mixture. This mixture is enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'.

This entire procedure and the 'gajapuṭa' is repeated more than once until appropriate 'vajra bhasma' is formed. However, after first 'puṭa', the obtained drug mixture is added again with all the above said drugs except 'rasasindūra'.

Like this in 14 number of 'gajapuṭa' it is possible to obtain appropriate white coloured 'vajra bhasma'. Later it is stored in suitable airtight container for further therapeutic use.

### Vajra māraṇa- 3rd method:

हीरकं विमलं तालं तथा रोगशिलामला । समं समं समादाय खरखल्वे विमर्दयेत् ।।
त्रिवर्षारूढकार्पासशिफास्वरसयोगतः । सम्पेष्य कामं यामैकं निदाघे परिशोषयेत् ।।
विशुष्कं संपुटे न्यस्य पुटयेत्तु महापुटे । एवं चतुर्दशपुटैर्हीरकं याति पञ्चताम् ।। (R. T. 23/22-24)

One part of 'śuddha vajra' is taken in a clean khalva yantra. It is carefully pounded and triturated to bring it in fine powder form. This powder is added with equal quantities of 'śuddha haratāla', 'śuddha manaḥśilā' and triturated to obtain a homogenous mixture.

This mixture is added with required quantity of 'kārpāsa śiphā (mūla) swarasa' and triturated thoroughly for one yāma (3 hours). Later the dry powder obtained is enclosed in 'śarāva sampuṭa' and subjected for one 'mahāpuṭa' using dry cow dung cakes.

This entire procedure and the 'mahāpuṭa' is repeated for 14 times to obtain an appropriate white coloured 'vajra bhasma'. Later it is stored in suitable airtight container for further therapeutic use.

**Bhasma colour:** White.

**Vajra bhasma- properties:**

सुमृतं हीरकं हृद्यं परमं षड्रसान्वितम् । योगवाहि मतञ्चैतत्सर्वोत्कृष्टं रसायनम् ।।
राजयक्ष्मप्रशमनं मेहमेदोविनाशनम् । पाण्डुशोथोदरहरं तथा क्लैब्यहरं परम् ।।
वृष्यं महायुष्यमतीव नेत्र्यं बल्यं त्रिदोषघ्नमतीव वर्ण्यम् ।
मेध्यं विशेषाद्विविधामयघ्नं सुधोपमं स्यात्सुमृतं तु हीरम् ।। (R. T. 23/25-27)

Perfectly prepared 'vajra bhasma' is a good cardio tonic (hṛdya) and possesses all the six rasa. It has synergistic (yogavāhī) action and is one among the best rejuvenators.

It is indicated in rājayakṣma, prameha, medovikāra, pāṇḍuroga, śotha and udararoga. It is the best medicine to cure impotency and is a good aphrodisiac.

Its judicious use provides longevity, improves the eyesight, enhances physical strength, mitigates all the three vitiated doṣas, improves skin complexion and promotes intellect. With rational use, 'vajra bhasma' can cure many more diseases. Therefore, it is equated with nectar (sudhā) in classics.

**Vajra bhasma- dosage:**

रक्तिकाया नेत्रगुणभागतस्तु कलांशकम् । मृतं हीरं प्रयुञ्जीत बलकालाद्यपेक्षया ।। (R. T. 23/28)

1/32 rattī to 1/16 rattī (3.9 to 7.8 mgs) is the general dose of 'vajra bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

**Vajra bhasma- dose making:**

रक्तिकैकमितं हीरं रम्ये खल्वे विनिक्षिपेत् । मेलयेद्रससिन्दूरं चतुर्माषकसंमितम् ।।
सम्पेष्य त्वतियत्नेन रसतन्त्रविचक्षणः । गुञ्जैकतः समारभ्य द्विगुञ्ज विनियोजयेत् ।।
(R. T. 23/29-30)

One rattī (125 mgs) of 'vajra bhasma' is triturated with four māṣa (4 gms) of 'rasasindūra' and the mixture is stored in suitable airtight container. In suitable disease conditions, one to two rattī (125 to 250 mgs) of this mixture can be administered daily along with suitable adjuvant.

dr.keshav-raj

**Vajra bhasma- āmayika prayoga:** (R. T. 23/31-33)

1. To cure severe 'impotency', suitable dosage of 'vajra bhasma' is added with equal quantity of 'rasasindūra' and administered daily along with 'butter'.
2. To cure chronic and full-fledged 'rājayakṣma' roga, suitable dosage of 'vajra bhasma' is added with equal quantities of 'swarṇa bhasma' and 'rasasindūra'; and administered daily along with suitable adjuvant.
3. To cure all types of 'impotency' complaints, suitable dosage of 'vajra bhasma' is added with equal quantity of 'makaradhwaja rasa' and administered daily along with suitable adjuvant.

**Vajra bhasma- compound formulations:**

1. Navaratnarājamṛgāṅka rasa
2. Maṇi parpaṭī
3. Vasantakusumākara rasa
4. Ratnagarbha poṭṭalī
5. Mahālakṣmīvilāsa rasa
6. Kapardakokila rasa
7. Hīraka rasāyana
8. Kāmadeva rasa

## 7. NĪLA RATNA

(Sapphire)

**Nīla ratna (sapphire)- general information:**

**Sapphire** (Greek: '*sappheiros*' is "blue stone") is a gemstone variety of the mineral corundum, an aluminium oxide (ñ-$Al_2O_3$). Trace amounts of other elements such as iron, titanium, chromium, copper or magnesium can give corundum blue, yellow, pink, purple, orange or greenish color.

**Occurrence:**

Sapphires are mined from alluvial deposits or from primary underground workings. The mining locations include Myanmar, Madagascar, Sri Lanka, Australia, Thailand, India, Pakistan, Afghanistan, Tanzania, Kenya and China. The Logan sapphire, the Star of India, and the Star of Bombay originate from Sri Lankan mines.

The sapphire deposits of Kashmir are still well known in the gem industry, despite the fact that the peak production from this area mostly took place in a relatively short period at the end of the 19th and early 20th centuries. At present, the world record price-per-carat for a sapphire at auction is held by a sapphire from Kashmir, which sold for over $145,000 per carat (over $3.8 million dollars in total) in November 2011.

### Nīla ratna- synonyms:

नीलो नीलोपलो नीलं नीलरत्नं सुनीलकम् । महानीलञ्च नीलाश्मशनिरत्नञ्च कीर्तितम् ।।

(R. T. 23/96)

Nīla, nīlotpala, nīlaratna, sunīlaka, mahānīla, nīlāśma and nīlaratna; all these are the synonymous words used for 'nīla ratna' (sapphire) in classics.

### Nīla ratna- brief history:

Since ages, we find the references of 'gemstones' in Indian history. Nīla ratna (sapphire) has lured people of all centuries. We find the first references of 'sapphire' in 'Bṛhat Saṁhitā' of 'Varāhamihira' in 5th century. Later with development of 'Rasaśāstra', the purification, incineration, piṣṭi preparation and the therapeutic utility of all gemstones was in practice.

### Nīla ratna- types:

Two types as per 'Rasaratnasamuccaya 4/49-50';

| Types | Quality | Description |
|---|---|---|
| 1. Indranīla | Uttama | Heavy and bluish gemstone with blackish shade deep within |
| 2. Jalanīla | Sādhāraṇa | Light weighted, bluish gemstone with whitish shade within |

### Nīla ratna- grāhya lakṣaṇa:

स्वच्छं सच्छायममलं मसृणं तु महोज्ज्वलम् । स्निग्धं गुरु लसज्ज्योतिर्जात्यं नीलं मतं बुधैः ।।

(R. T. 23/97)

The 'nīla' (sapphire), which is crystal clear, radiant, semi-transparent, lustrous, soft and smooth to touch, heavy and having bright blue colour; such a sample of 'sapphire' is considered fit and selected for pharmaceutical purposes.

### Nīla ratna- agrāhya lakṣaṇa:

रक्तार्द्धं विगतच्छायं रूक्षं लघु च कोमलम् । परिहेयं शौरिरत्नं मतं रत्नपरीक्षकैः ।। (R. T. 23/98)

The 'nīla' (sapphire), which is partially reddish and the remaining part bluish, opaque, rough surfaced, light weighted, malleable or brittle; such a sample of 'sapphire' is considered unfit and is rejected for any of the pharmaceutical purposes.

### Nīla ratna śodhana:

नीलीस्वरससंयुक्तं दोलायन्त्रे विधानतः । यामैकं परिपक्वन्तु नीलं शुद्ध्यति निश्चितम् ।।

(R. T. 23/99)

The roughly pounded 'nīla' is tied in a 'poṭṭalī' and subjected for 3 hours (one yāma) of 'swedana' in 'dolāyantra' by keeping 'nīla swarasa' as liquid media. Later the drug is dried and stored in airtight container as 'śuddha nīla' for further pharmaceutical use.

**Nīla ratna sāmānya māraṇa:**

लकुचद्रावसंपिष्टैः शिलागन्धकतालकैः । वज्रं विनान्यरत्नानि म्रियन्तेऽष्टपुटैः खलु ॥

(R. R. S. 4/66)

1. The fine powders of any of the individual Śuddha ratna (except vajra) - 1 part; 2. Śuddha manaḥśilā - 1 part; 3. Śuddha gandhaka - 1 part; and 4. Śuddha haratāla - 1 part; all these are taken in a clean khalva yantra and subjected for 3 bhāvanās with 'lakuca swarasa'.

Later cakrikās are prepared, dried and enclosed in śarāva sampuṭa. This sampuṭa is subjected for one gajapuṭa. This whole process is repeated for 8 times to obtain properly prepared bhasma of six gemstones of mineral origin except vajra.

**Nīla ratna māraṇa:**

माणिक्यमारणोद्दिष्टविधिभ्यामतियत्नतः । मारयेच्छनिरत्नं तु रसागमविशारदः ॥ (R. T. 23/100)

The methods followed for incineration of 'nīla' are same as that of the two methods (1st and 2nd method) followed to obtain 'māṇikya bhasma' (find above under the relevant heading).

**Bhasma colour:** Properly prepared bhasma will have white colour.

**Nīla ratna piṣṭi:**

Śuddha nīla ratna is taken in a clean khalva yantra and triturated to obtain it in fine powder form. It is added with desired quantity of 'gulāba jala' (rose water) and triturated thoroughly for 3 days to obtain very fine pale white coloured powder with rose fragrance. It is later stored in suitable airtight container as 'nīla ratna piṣṭi'.

**Nīla ratna bhasma- properties:**

नीलं तु सुमृतं वृष्यं बल्यं दीपनमुत्तमम् । त्रिदोषशमनं वर्ण्यं गुदजामयनाशनम् ॥
त्वच्यं कुष्ठादिदोषघ्नं श्वासकासनिषूदनम् । कफपित्तानिलहरं विषमज्वरनाशनम् ॥

(R. T. 23/101-102)

श्वासकासहरं वृष्यं त्रिदोषघ्नं सुदीपनम् । विषमज्वरदुर्नामपापघ्नं नीलमीरितम् ॥ (R. R. S. 4/55)

Properly prepared 'nīla bhasma' is aphrodisiac, strengthening, appetizer and mitigates all the three vitiated doṣas. Its judicious internal use provides good skin complexion and cures many diseases of anal region. It is good to skin and is indicated in kuṣṭha roga, śwāsa and kāsa roga. It mitigates the vitiated kapha, pitta and vāta doṣa. It nullifies the effects of poison in the body.

It is useful in śwāsa and kāsa roga. It is aphrodisiac, mitigates all the three vitiated doṣa and is a good appetizer. It is also useful in viṣamajwara, arśa roga and diseases due to sins.

**Nīla ratna bhasma- dosage:**

गुञ्जाष्टमांशप्रमितात् गुञ्जार्द्धप्रमितं परम् । सुमृतं नीलरत्नं तु प्राणाचार्यः प्रयोजयेत् ।।

(R. T. 23/103)

Quarter rattī to half rattī (31 to 62 mgs) is the general dose of 'nīla bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

**Nīla ratna- compound formulations:**

1. Navaratnarājamṛgāṅka rasa
2. Maṇi parpaṭī
3. Ratnabhāgottara rasa

## 8. GOMEDA

(Zircon, 'Hassonite', 'Agate' or 'Cinnamon Stone')

**Gomeda (zircon)- introduction:**

**Zircon** (hyacinth or yellow zircon) is a mineral belonging to the group of neso-silicates. Its chemical name is 'zirconium silicate' and its corresponding chemical formula is $ZrSiO_4$. It is also called as 'hassonite', 'agate' and 'cinnamon stone'. Its hardness is 7.25; specific gravity 3.65; refractive index 1.73 to 1.15.

**Colour:**

The natural color of zircon varies between colourless, yellow-golden, red, brown, blue, and green. Colourless specimens that show gem quality are a popular substitute for diamond; these specimens are also known as "Matura diamond".

**Occurrence:**

Zircon is ubiquitous in the crust of Earth. It occurs in igneous rocks (as primary crystallization products), in metamorphic rocks and in sedimentary rocks (as detrital grains). Large zircon crystals are rare. Their average size in granite rocks is about 0.1-0.3 mm, but they can also grow to sizes of several centimetres, especially in pegmatites.

Because of their uranium and thorium content, some zircons might undergo metamictization. Connected to internal radiation damage, these processes partially disrupt the crystal structure and partly explain the highly variable properties of zircon. As zircon becomes more and more modified by internal radiation damage, the density decreases, the crystal structure is compromised and the color changes.

Zircon occurs in many colors, including red, pink, brown, yellow, hazel, or black. It can also be colorless. The color of zircons can sometimes be changed by heat treatment. Depending on the amount of heat applied, colorless, blue, or golden-yellow zircons can be made. In geological settings, the development of pink, red, and purple zircon occurs after hundreds of millions of years, if the crystal has sufficient trace elements to produce color centers. Color in this red or pink series is annihilated in geological conditions above the temperature of 350⁰C.

Zircon is a common accessory to trace mineral constituent of most granite and felsic igneous rocks. Due to its hardness, durability and chemical inertness, zircon persists in sedimentary deposits and is a common constituent of most sands. Zircon is rare within mafic rocks and very rare within ultramafic rocks aside from a group of ultrapotassic intrusive rocks such as kimberlites, carbonatites, and lamprophyre, where zircon can occasionally be found as a trace mineral owing to the unusual magma genesis of these rocks.

Zircon forms economic concentrations within heavy mineral sands ore deposits, within certain pegmatites and within some rare alkaline volcanic rocks, for example the Toongi Trachyte, Dubbo, New South Wales Australia in association with the zirconium-hafnium minerals eudialyte and armstrongite. It is also found in Sri Lanka, Madagascar, Canada, Brazil, Russia, California and US.

### Gomeda- synonyms:

गोमेदकश्च गोमेदः पिङ्गस्फटिक इत्यपि । गोमेदो राहुरत्नञ्च कीर्तितञ्च तमोमणिः ।।

(R. T. 23/120)

Gomedaka, piṅga-sphaṭika, rāhu-ratna, tamomaṇi; are the synonymous words used in the classics for 'gomeda' (zircon).

### Gomeda- brief history:

Since ages, we find the references of 'gemstones' in Indian history. Gomeda (zircon) has lured people of all centuries. We find the first references of 'zircon' in 'Bṛhat Saṁhitā' of 'Varāhamihira' in 5th century. Later with development of 'Rasaśāstra', the purification, incineration, piṣṭi preparation and the therapeutic utility of all gemstones was in practice.

**Gomeda- types:**

Four types depending on the colour;

| | Types | Quality |
|---|---|---|
| 1 | Śwetābha pīta | Best |
| 2 | Raktābha pīta | Better |
| 3 | Pīta | Medium |
| 4 | Kṛṣṇābha pīta | Low |

**Gomeda- grāhya swarūpa:**

सुस्वच्छगोजलच्छायं स्वच्छं स्निग्धं समं गुरु । निर्दलं मसृणं दीप्तं गोमेदं शुभमष्टधा ।।

(R. R. S. 4/54)

The 'gomeda' (zircon), which is clean, which has the colour of 'gomūtra' (cow's urine), which is snigdha, even looking, heavy, lustrous, soft bodied and lustrous; the sample of 'gomeda' with these eight symptoms should be considered fit and selected for therapeutic purposes.

- Another reference:

गोमूत्राभं स्निग्धममन्दं समगात्रं हेमारक्तं निर्दलमच्छं गुरुभारम् ।
दीप्तच्छायं मञ्जुलरूपं मसृणं यद् गोमेदाख्यं रत्नमिह स्यात्तज्जात्यम् ।। (R. T. 23/121)

The 'gomeda' (zircon), which has the colour of 'gomūtra' (cow's urine), which is smooth to touch, which has golden reddish colour, clean and heavy, which is lustrous, beautiful and soft bodied; such a sample of 'gomeda' should be considered fit and selected for therapeutic purposes.

**Gomeda- agrāhya swarūpa:**

सत्रासं विगतच्छायं चिपिटं मलिनप्रभम् । सदलं लघु रूक्षं च गोमेदं हेयमीरितम् ।। (R. T. 23/122)

Gomeda (zircon) with admixture of different colours (trāsa), with less or no radiance, flat body, dirty shine, with layers, light weight and with rough surface; such a sample of 'gomeda' should be considered unfit and rejected for therapeutic purposes.

**Gomeda- śodhana:**

निम्बुकस्वरसेनेह दोलायन्त्रे विधानतः । परिस्वित्रं तु यामैकं शुद्धिमायात्यनुत्तमाम् ।। (R. T. 23/123)

The roughly pounded 'gomeda' (zircon) is tied in a 'poṭṭalī' and subjected for 3 hours (one yāma) of 'swedana' in 'dolāyantra' by keeping 'nimbū swarasa' as liquid media. Later the drug is washed, dried and stored in airtight container as 'śuddha gomeda' for further pharmaceutical use.

**Gomeda sāmānya māraṇa:**

लकुचद्रावसंपिष्टैः शिलागन्धकतालकैः । वज्रं विनान्यरत्नानि म्रियतेऽष्टपुटैः खलु ॥

(R. R. S. 4/66)

1. The fine powders of any of the individual śuddha ratna (except vajra) - 1 part; 2. Śuddha manaḥśilā - 1 part; 3. Śuddha gandhaka - 1 part; and 4. Śuddha haratāla - 1 part; all these are taken in a clean khalva yantra and subjected for 3 bhāvanās with 'lakuca swarasa'.

Later cakrikās are prepared, dried and enclosed in śarāva sampuṭa. This sampuṭa is subjected for one gajapuṭa. This whole process is repeated for 8 times to obtain properly prepared bhasma of six gemstones of mineral origin except vajra.

**Gomeda viśeṣa māraṇa:**

माणिक्यमारणोद्दिष्टविधिभ्यामतियत्नतः । अष्टवारं सुपुटितं गोमेदं मृतिमाप्नुयात् ॥

(R. T. 23/124)

The methods followed for incineration of 'gomeda' are same as that of the two methods (1st and 2nd method) followed to obtain 'māṇikya bhasma' using eight 'puṭa'; (find above under the relevant heading).

**Bhasma colour:** The properly prepared bhasma will have 'coffee' (reddish brown) colour.

**Gomeda piṣṭi:**

Śuddha gomeda is taken in a clean khalva yantra and triturated to obtain it in fine powder form. It is added with desired quantity of 'gulāba jala' (rose water) and triturated thoroughly for 3 days to obtain very fine pale white coloured powder with rose fragrance. It is later stored in suitable airtight container as 'gomeda piṣṭi'.

**Gomeda bhasma- properties:**

गोमेदकं रुचिकरं दीपनं पाचनं परम् । त्वग्दोषशमनं बल्यं कफपित्तप्रणाशनम् ॥
उष्णं पाण्ड्वामयहरं क्षयक्षयकरं परम् । समाख्यातं विशेषेण बुद्धिसंवर्द्धनं तथा ॥

(R. T. 23/125-126)

Properly prepared 'gomeda bhasma' is a good appetizer and digestive. It is useful in skin ailments. Its judicious use for internal administration improves the physical strength.

It mitigates the vitiated kapha and pitta doṣa. It possesses 'uṣṇa' guṇa and is indicated in pāṇḍu roga and kṣaya roga. Its use strengthens the central nervous system.

- Other references are;

गोमेदं कफपित्तघ्नं क्षयपाण्डुक्षयङ्करम् । दीपनं पाचनं रुच्यं त्वच्यं बुद्धिप्रबोधनम् ।। (R. R. S. 4/56)
गोमेदकोऽम्ल उष्णश्च वातकोपविकारजित् । दीपनः पाचनश्चैव धृतोऽयं पापनाशनः ।।
(Āy. Pra. 5/116)

**Gomeda bhasma- dosage:**

आरभ्यं गुञ्जापादांशाद् गुञ्जैकप्रमितं मृतम् । गोमेदं तु प्रयुञ्जीत बलकालाद्यपेक्षया ।।
(R. T. 23/127)

Quarter rattī to one rattī (31 to 125 mgs) is the general dose of 'gomeda bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

**Gomeda- compound formulations:**

1. Navaratnarājamṛgāṅka rasa
2. Ratnabhāgottara rasa

## 9. VAIḌŪRYA

(Cat's eye)

**Vaiḍūrya (cat's eye)- introduction:**

Cat's eye is a hard gemstone with orthorhombic structure. It is chemically identified as 'Beryllium aluminate' ($BeAl_2O_4$). It has hardness of 8.5; specific gravity of 3.72; refractive index of 1.75.

The best variety of cat's eye possesses light golden brown colour. When cut, the transverse section of this mineral appears like the eye of the cat, therefore it is named as cat's eye.

Cat's eye and alexandrite are the two varieties of Chryosoberyl. The name Chrysobryl is a Greek word. Here 'chrysos' means golden and 'beryllos' means content.

**Occurrence:**

Cat's eye is found in Sri Lanka, Brazil, China, Myanmar, Russia, Norway and US, India, it is available in Jammu and Kashmir.

**Vaiḍūrya- synonyms:**

विदूररत्नं वैदूर्यं केतुरत्नं विदुरजम् । विडालाख्यं विडालाक्षं वायजञ्च प्रकीर्तितम् ।। (R. T. 23/112)

Vidura ratna, ketu ratna, viduraja, viḍālākhya, viḍālākṣa and vāyaja; all these are the synonymous words used in the classics for 'vaiḍūrya' (cat's eye).

### Vaiḍūrya- brief history:

Since ages we find the references of 'gemstones' in Indian history. Vaiḍūrya (cat's eye) has lured people of all centuries. We find the references of 'vaiḍūrya' in 'Śrīmadbhāgavata', the stories of 'Mahābhārata' and in the 'Bṛhat Saṁhitā'.

From the period of 'Saṁhitā', the therapeutic use of 'māṇikya' was thought about. Its references are found in many places of 'Caraka Saṁhitā'. Later with development of 'Rasaśāstra', the purification, incineration, piṣṭi preparation and the therapeutic utility of all gemstones was in practice.

### Vaiḍūrya- types:

(I) Four types depending on the colour;
 1. White coloured; 2. Smoky coloured 3. Blackish coloured and 4. Mixture of different colours;
(II) Two types depending on source;
 1. Chryosoberyl or Emerald group (Marakata varga) and 2. Quartz group (Sphaṭika varga);
(III) Two types presently available;
 1. Cat's eye (Viḍālākṣa) and 2. Alexandride.

### Vaiḍūrya- grāhya swarūpa:

वैडूर्यं श्यामशुभ्राभं समं स्वच्छं गुरु स्फुटम् । अभ्रशुभ्रोत्तरीयेण गर्भितं शुभमीरितम् ।।

(R. R. S. 4/57)

The 'vaiḍūrya', which is blackish white in colour; which comes in even shapes; which is soft, heavy and lustrous like that of bright variety of mica within; such a sample of 'vaiḍūrya' (cat's eye) is considered fit and is selected for the pharmaceutical purposes.

- Another reference:

वैदूर्यं गुरु सुस्निग्धं विडालेक्षणसप्रभम् । भ्रमच्छुभ्रोत्तरीयाढ्यं वैदूर्यं जात्यमुच्यते ।। (R. T. 23/113)

### Vaiḍūrya- agrāhya swarūpa:

विच्छायं लघु रूक्षञ्च सत्रासं चिपिटं खरम् । कृष्णं तथा मृच्छिलाढ्यं वैदूर्यं हेयमीरितम् ।।

(R. T. 23/114)

The 'vaiḍūrya', which is non-radiant, light weighted, dry looking, having mixture of different colours (trāsa), flat bodied, rough surfaced, with blackish shade or the one with small muddy segments in it; such a sample of 'vaiḍūrya' (cat's eye) is considered unfit and is rejected for the pharmaceutical purposes.

**Vaiḍūrya- śodhana:**

त्रिफलाक्वथितोपेतं वैदूर्यं याममात्रकम् । दोलायन्त्रे परिस्विन्नं शुद्धिमायात्यनुत्तमाम् ।।

(R. T. 23/115)

The roughly pounded 'tārkṣya' (emerald) is tied in a 'poṭṭalī' and subjected for 3 hours (one yāma) of 'swedana' in 'dolāyantra' by keeping 'triphalā kwātha' as liquid media. Later the drug is washed, dried and stored in airtight container as 'śuddha vaiḍūrya' for further pharmaceutical use.

**Vaiḍūrya sāmānya māraṇa:**

लकुचद्रावसंपिष्टैः शिलागन्धकतालकैः । वज्रं विनान्यरत्नानि म्रियन्तेऽष्टपुटैः खलु ।।

(R. R. S. 4/66)

1. The fine powders of any of the individual śuddha ratna (except vajra) - 1 part; 2. Śuddha manaḥśilā - 1 part; 3. Śuddha gandhaka - 1 part; and 4. Śuddha haratāla - 1 part; all these are taken in a clean khalva yantra and subjected for 3 bhāvanās with 'lakuca swarasa'.

Later cakrikās are prepared, dried and enclosed in śarāva sampuṭa. This sampuṭa is subjected for one gajapuṭa. This whole process is repeated for 8 times to obtain properly prepared bhasma of six gemstones of mineral origin except vajra.

**Vaiḍūrya viśeṣa māraṇa:**

माणिक्यमारणोद्दिष्टविधिभ्यामतियत्नतः । विदूररत्नं पुटितं त्वष्टधा मृतिमाप्नुयात् ।।

(R. T. 23/116)

The methods followed for incineration of 'vaiḍūrya' are same as that of the two methods (1st and 2nd method) followed to obtain 'māṇikya bhasma' using eight 'puṭa'; (find above under the relevant heading).

**Colour of bhasma:** Properly prepared bhasma will be of 'white' colour.

**Vaiḍūrya piṣṭi:**

Śuddha vaiḍūrya is taken in a clean khalva yantra and triturated to obtain it in fine powder form. It is added with desired quantity of 'gulāba jala' (rose water) and triturated thoroughly for 3 days to obtain very fine pale white coloured powder with rose fragrance. It is later stored in suitable airtight container as 'vaiḍūrya piṣṭi'.

### Vaiḍūrya bhasma- properties:

सुमृतं खलु वैदूर्यं मधुरं शिशिरं परम् । दीपनं मेध्यमायुष्यं बल्यं च मलभेदनम् ।।
रक्तपित्तप्रशमनं चक्षुष्यं बृंहणं परम् । पित्तामयप्रशमनं समाख्यातं विशेषतः ।। (R. T. 23/117-118)

Properly prepared 'vaiḍūrya bhasma' possesses madhura rasa and śīta guṇa. It is a good appetizer. It enhances the intellect, provides longevity and physical strength. It is mild laxative and cures all types of constipation.

It is useful in raktapitta roga. Its judicious use improves the eyesight; it adds to the body mass and cures all types of pittaja roga as it has madhura rasa and śīta guṇa.

- Another reference is as given below;

वैदूर्यं रक्तपित्तघ्नं प्रज्ञायुर्बलवर्द्धनम् । पित्तप्रधानरोगघ्नं दीपनं मलमोचनम् ।। (R. R. S. 4/59)

### Vaiḍūrya bhasma- dosage:

वस्वंशतो रक्तिकाया वैदूर्यं गुञ्जसंमितम् । प्राणाचार्यः प्रयुञ्जीत बलकालाद्यपेक्षया ।।
(R. T. 23/119)

Quarter rattī to one rattī (31 to 125 mgs) is the general dose of 'vaiḍūrya bhasma'. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

### Vaiḍūrya- compound formulations:

1. Navaratnarājamṛgāṅka rasa
2. Ratnabhāgottara rasa
3. Indrokta rasāyana
4. Cūrṇāñjana
5. Piṇḍāñjana

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## Chapter 20
# UPARATNA
## (Semiprecious Stones)

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The gemstones, which are less attractive in comparison with 'ratna' (precious stones), are grouped as 'uparatna' (semiprecious stones). When compared with 'ratna', 'uparatna' possess lesser lustre, transparency, hardness, attractiveness and durability; moreover, they have far lesser therapeutic efficacy.

These 'uparatna' are not so rare and costly in comparison with 'ratna'; and it is not always possible to afford a 'ratna' for pharmaceutical purposes. In such situations, these 'uparatna' are used as replacement for 'ratna'.

Though classical books have specified the number of 'precious stones' (ratna) as nine; they are uncertain about the number of 'semiprecious stones' (uparatna). In this regard the clear and the better opinion is of 'Śrī Sadānanda Śarmā', the author of 'Rasataraṅgiṇī', which is as given below;

> वैक्रान्तं सूर्यकान्तश्च चन्द्रकान्तो नृपोपलः । पेरोजकञ्च स्फटिकं क्षुद्ररत्नगणो ह्ययम् ॥
>
> (R. T. 23/154)

There are six uparatna: 1. Vaikrānta 2. Sūryakānta 3. Candrakānta 4. Rājāvarta 5. Pairojaka 6. Sphaṭika; but CCIM has added many more drugs to the list of uparatna. They are;

1. Vaikrānta (Tormaline) (Mg, Mn, Fe, Ca, Na, K, Li, H,F,$Al_3$,$B_2$,$SiO_4$, $O_2$);
2. Sūryakānta (Sun stone) ($Na_2$ O $Al_2O_3$ $6SiO_2$ + CaO, $Al_2$ $O_3$ $2SiO_2$);
3. Candrakānta (Moon stone) (K Al $Si_3$ $O_8$/Na Al $Si_2$ $O_8$);
4. Rājāvarta (Lapis lazuli/Altra marine) ($(Na,Ca)_8(AlSiO_4)_6(S,SO_4,Cl)_{1\text{-}2}$);
5. Perojaka
6. Sphaṭika (Rock crystal ($SiO_2$)

Additional 'semiprecious stones' counted in new CCIM Syllabus;

7. Vyomāśma (Jade) (Na Al ($SiO_3$))
8. Tṛṇakānta (Amber; Succinum)
9. Pālaṅkam (Onyx; $CaSO_4$ $2H_2O$)
10. Pūtika (Peridote)
11. Rudhiram (Carnelion)

### 1. VAIKRĀNTA
### (Tourmaline)

The mineral 'vaikrānta' (tourmaline) is counted both under 'mahārasa varga' and under 'uparatna'. Since the drug is found most useful in pharmaceutical procedures of mercury (pārada karma), its inclusion under 'mahārasa' group is justified.

In addition, this drug is used as replacement for 'vajra' (diamond); therefore, it might have been included in 'uparatna' group. The detailed explanation of 'vaikrānta' may be traced from 15th chapter.

## 2. SŪRYAKĀNTA

(Sun Stone)

**Sūryakānta (sun stone)- introduction:**

Sunstone is a plagioclase feldspar, which when viewed from certain directions exhibits a brilliant spangled appearance; this has led to its use as a gemstone. Chemically it is identified as $Na_2O\ Al_2O_3\ 6SiO_2 + CaO, Al_2O_3\ 2SiO_2$. It is the mixture of sodium, aluminium, silicon, calcium and oxygen.

It comes in numerous colours including blue, grey, white, pink, green and brown. It exhibits uneven to conchoidal fracture with hardness of 6. It possesses opalescent lustre with white streak; specific gravity of 2.61 and refractive index of 1.72.

The optical effect appears to be due to reflections from inclusions of red copper, in the form of minute scales, which are hexagonal, rhombic, or irregular in shape, and are disposed parallel to the principal cleavage-plane. These inclusions give the stone an appearance something like that of aventurine, hence sunstone is known also as "aventurine-feldspar."

The optical effect called shiller and the color in Oregon Sunstone is due to copper. In the middle part of this crystal, it sparks a lot, and usually has a dark color in the middle, and the color becomes lighter as it becomes the outer part.

**Occurrence:**

It has been found in Southern Norway, and in some United States localities. It is the official gemstone of Oregon. Sunstone was not common until recently. Previously the best-known locality being Tvedestrand, near Arendal, in south Norway, where masses of the sunstone occur embedded in a vein of quartz running through gneiss. Due to the discovery of large deposits in Oregon, Sunstone is now readily available.

Other locations include near Lake Baikal in Siberia, and several United States localities-notably at Middletown Township, Delaware County, Pennsylvania, Lakeview, Oregon, and Statesville, North Carolina.

**Sūryakānta- synonyms:**

सूर्यकान्तः सूर्यमणिस्तथा सूर्योपलाह्वयः । दीप्तोपलो वह्निगर्भो तथैव ज्वलनोपलः ।।

(R. T. 23/182)

Sūryamaṇi, sūryopala, dīptopala, vahnigarbha and jwalanopala; all these are the synonymous words used in the classics for 'sūryakānta'.

**Sūryakānta- brief history:**

Sūryakānta has a long history. In many places of 'Caraka Saṁhitā' and 'Suśruta Saṁhitā', we find its references, where it is used for the purpose of treatment. With the evolution of 'Rasaśāstra', the gemstone was extensively studied, described and used for its therapeutic values.

**Sūryakānta- types:**

Not specified in classics.

**Sūryakānta- grāhya lakṣaṇa:**

विमलो निस्तुषः स्निग्धो घृष्टो व्योमसुनिर्मलः । मसृणो निर्व्रणश्चैव जात्यः सूर्योपलः स्मृतः ।।

(R. T. 23/183)

The 'sūryakānta', which is crystal clear, which does not possess whitish lines within (nistuṣa), which is soft to touch and shines when rubbed on an even surface, which is lustrous and aberration free; such a sample of 'sūryakānta' is considered fit and selected for pharmaceutical use.

**Sūryakānta- test for perfection:**

यस्तु सूर्यांशुसंस्पृष्टः प्रसूते दहनप्रभाम् । स एक जात्यः कथितः सूर्यकान्तः परीक्षकैः ।।

(R. T. 23/184)

The 'sūryakānta', when held under hot sun, acts like 'magnifying glass' and burns the paper, cotton or such soft material placed beneath it. This is the way to check the perfectness of 'sūryakānta'.

**Sūryakānta- śodhana:**

Not mentioned in classics.

**Sūryakānta- māraṇa:**

सूर्यकान्तः सुसम्पिष्टः शिलावलिसमन्वितः । सप्तधा पुटितो यत्नान्म्रियते नात्र संशयः ।।

(R. T. 23/186)

Required quantity of 'sūryakānta' is taken in a clean khalva yantra. It is added with equal quantities of 'śuddha manaḥśilā' and 'śuddha gandhaka' and triturated to obtain a homogenous mixture.

This mixture is enclosed in 'śarāva sampuṭa' and subjected for one puṭa (laghupuṭa). This entire procedure is repeated for seven times to obtain properly prepared 'sūryakānta bhasma'.

### Sūryakānta- dose and adjuvant:

Quarter to one rattī (32 mgs to 125 mgs) is the general dose of 'sūryakānta bhasma'. It may be administered along with honey.

### Sūryakānta- properties:

> सूर्यकान्तो मतो मेध्य उष्णश्चैव रसायनः । बलासवातशमनो विशेषेण च कीर्तितः ।।
>
> (R. T. 23/185)

Sūryakānta when used judiciously in appropriate dosage form acts as intellect promoter (medhya). It possesses 'uṣṇa' guṇa and is a rejuvenator. It mitigates vitiated kapha and vāta doṣa.

## 3. CANDRAKĀNTA

(Moon Stone)

### Candrakānta (moon stone)- general information:

**Moonstone** is a sodium potassium aluminium silicate, with the chemical formula $K\,Al\,Si_3\,O_8/Na\,Al\,Si_2\,O_8$. It possesses hardness of 6 and specific gravity of 2.6. Its name is derived from a visual effect or sheen, caused by light reflecting internally in the moonstone from layer inclusion of different feldspars.

Moonstone has been used as jewellery for centuries, including ancient civilizations. The Romans admired moonstone, as they believed it was born from solidified rays of the moon. Both the Romans and Greeks associated Moonstone with their lunar gods and goddesses.

### Geology:

The most common moonstone is of the mineral adularia. The plagioclase feldspar oligoclase also produces moonstone specimens. Moonstone is feldspar with a pearly and opalescent lustre. An alternate name is *hecatolite.*

### Formation:

Moonstone is composed of two feldspar species, orthoclase and albite. The two species are intermingled. Then, as the newly formed mineral cools, the intergrowth of orthoclase and albite separates into stacked, alternating layers. When light falls between these thin, flat layers, it scatters in many directions producing the phenomenon called adularescence.

**Occurrence:**

Deposits of moonstone occur in Australia, the Austrian Alps, Mexico, Madagascar, Burma, Norway, Poland, Sri Lanka and the United States. It is currently the state gem for Florida.

**Candrakānta- synonyms:**

इन्दुकान्तश्चन्द्रकान्तश्चन्द्राश्मा चन्द्रजोपलः । शीतात्मा चन्द्रिकाद्रावः शशिकान्तश्च सप्तधा ॥
(Āy. Pra. 5/142)

चन्द्रकान्तश्चन्द्रमणिस्तथा चन्द्रोपलाह्वयः । शशिकान्तश्चेन्दुकान्तः स एव परिकीर्तितः ॥
(R. T. 23/187)

Indukānta, candrāśma, candrajopala, śītātma, candrikādrāva and śaśikānta; candramaṇi and candropala; all these are the synonymous words used in the classics for 'candrakānta'.

**Candrakānta- brief history:**

Candrakānta has a long history. Its reference is found in 'Bṛhat Saṁhitā' (5th century), where it is used for the purpose of treatment. With the evolution of 'Rasaśāstra', the gemstone was extensively studied, described and used for its therapeutic values.

**Candrakānta- types:**

Not specified in classics.

**Candrakānta- grāhya swarūpa:**

यन्निर्मलं सुमसृणं शिशिरं च पीतं स्निग्धं परं सुविशदं परमं पवित्रम् ।
स्रावं स्रवत्यथ परं तुहिनांशुसंगाच्चन्द्रोपलं खलु तदेव मतं तु जात्यम् ॥ (R. T. 23/188)

The 'candrakānta', which is crystal clear and lustrous; which is cold to touch and has yellowish shade; which is snigdha, 'viśada' and pavitra (auspicious); which when exposed to moon, leaves out moisture on its surface; such a sample of 'candrakānta' is considered fit and is selected for pharmaceutical use.

**Candrakānta- śodhana:**

Not mentioned in classics.

**Candrakānta māraṇa:**

कुनटीहिङ्गुलोपेतः कन्यानीरेण पेपितः । चन्द्रकान्तः सुपुटितो म्रियते नात्र संशयः ॥ (R. T. 23/190)

Required quantity of 'candrakānta' is taken in a clean khalva yantra. It is added with equal quantities of 'śuddha manaḥśilā' and 'śuddha hiṅgula' and triturated to obtain a homogenous mixture.

This mixture is enclosed in 'śarāva sampuṭa' and subjected for one puṭa (laghupuṭa). This entire procedure is repeated for seven times to obtain properly prepared 'candrakānta bhasma'.

**Candrakānta dosage and adjuvant:**

Half to one rattī (62 to 125 mgs) is the general dosage of candrakānta bhasma. It is administered along with honey.

**Candrakānta- properties:**

> चन्द्राकान्तोऽतिशिशिरः स्निग्धः पित्तापहः परम् । रक्तपित्तप्रशमनस्तथा दाहनिषूदनः ॥
>
> (R. T. 23/189)

Candrakānta possesses very much 'śīta guṇa'; it is snigdha, it mitigates vitiated pitta doṣa, cures raktapitta roga and brings down the burning sensation all over the body.

- Another reference:

> शिशिरश्चन्द्रकान्तस्तु स्निग्धः पित्तास्रतापनुत् । शिवप्रीतिकरः स्वच्छो ग्रहालक्ष्मीविनाशनः ॥
>
> (R. R. S. 4/3)

Candrakānta possesses 'śīta guṇa'; it is snigdha and mitigates vitiated pitta doṣa. It is considered as 'śivapriya ratna'. If worn on body, it is claimed to bring on good wealth.

## 4. RĀJĀVARTA

(Lapis Lazuli)

**Rājāvarta (lapis lazuli)- general information:**

**Lapis lazuli** is a relatively rare semi-precious stone that has been prized since antiquity for its 'intense blue' color. It is a rock, largely formed from the mineral lazurite. The main component of lapis lazuli is 'lazurite' (25% to 40%), a feldspathoid silicate mineral with the formula $(Na,Ca)_8(AlSiO_4)_6(S,SO_4,Cl)_{1-2}$.

**Occurrence:**

It was being mined in the Badakhshan province of Afghanistan as early as the 3rd millennium BC and there are sources that are found as far east as in the region around Lake Baikal in Siberia.

Trade in the stone is ancient enough for lapis jewellery to have been found at Predynastic Egyptian and ancient Sumerian sites and as lapis beads at neolithic burials in Mehrgarh, the Caucasus and even as far from Afghanistan as Mauritania. Its mines are also found in Germany, Myanmar and Persian countries. In India it is found in Ajmer of Rajasthan.

Most lapis lazuli also contains calcite (white), sodalite (blue), and pyrite (metallic yellow). Other possible constituents: augite; diopside; enstatite; mica; hauynite; hornblende and nosean.

Some lapis lazuli contains trace amounts of the sulhur-rich lullingite variety *geyerite.* Lapis lazuli usually occurs in crystalline marble as a result of contact metamorphism.

**Rājāvarta- synonyms:**

राजावर्त्तो नृपावर्त्त आवर्तमणिरित्यपि । नृपोपलश्च नीलाश्मा स एव परिकीर्तितः ।। (R. T. 23/191)
राजावर्त्तो नृपावर्त्तो राजन्यावर्तकस्तथा । आवर्तमणिरावर्तः स्यादित्येष शराह्वयः ।।
(Āy. Pra. 5/145)

Nṛpāvarta, āvartamaṇi, nṛpopala nīlāśma; rājanyāvarta and āvarta; all these are the synonymous words used in the classics for 'rājāvarta'.

**Rājāvarta- brief history:**

Rājāvarta has a long history. Its first reference is found in 'Bṛhat Saṁhitā' (5th century), where it is used for the purpose of treatment. With the evolution of 'Rasaśāstra', the gemstone was extensively studied, described and used for its therapeutic values.

**Rājāvarta- types:**

एकश्चूर्णाकृतिर्ज्ञेयो द्वितीयो गोलकात्मकः । (Ānandakanda Kriyā. 8/196)

(I) Two types based on the form in which it is obtained;
1. Cūrṇākṛtī rājāvarta (powder form)
2. Golākṛtī rājāvarta (in bolus form)

राजावर्त्तोऽल्परक्तोरुनीलिमामिश्रितप्रभः । (R. R. S. 4/5)

(II) Three types depending on colour;
1. Alparakta varṇa (pale red colour)
2. Nīla varṇa ( blue colour)
3. Miśrita varṇa (mixed colour)

**Rājāvarta- grāhya swarūpa:**

यन्निर्मलः सुमसृणः खलु गारशून्यः स्निग्धश्च शारदनिरभ्रनिभः सुनीलः ।
कृष्णो गुरुश्च शिखिकण्ठसमप्रकाशो राजोपलः खलु स एव मतस्तु जात्यः ।। (R. T. 23/192)

The 'rājāvarta', which is crystal clear, lustrous and dirt free; which is smooth; which is bluish like the cloudless sky of 'śaratkāla' or blackish; which is heavy and as radiant as neck of peacock; such a sample of 'rājāvarta' is considered fit and is selected for pharmaceutical use.

### Rājāvarta śodhana- 1st method:

सगव्यमूत्रः सक्षारो निम्बूकद्रवयोगतः । स्विन्नो नृपोपलो यामं शुद्धिमायात्यनुत्तमाम् ॥

(R. T. 23/193)

The roughly pounded 'rājāvarta' is tied in a 'poṭṭalī' hung in 'dolāyantra' containing equal ratios of 'gomūtra', 'nimbū swarasa' and 'yavakṣāra' as liquid media and subjected for 3 hours (one yāma) of 'swedana'. Later the drug is washed, dried and stored in airtight container as 'śuddha rājāvarta' for further pharmaceutical use.

### Rājāvarta śodhana- 2nd method:

निम्बूकाम्लसमायुक्तः सजलः क्षारसंयुतः । नृपोपलः परिस्विन्नो विशुद्ध्यति न संशय ॥

(R. T. 23/194)

The roughly pounded 'rājāvarta' is tied in a 'poṭṭalī' hung in 'dolāyantra' containing equal ratios of 'nimbū swarasa', 'yavakṣāra' and 'water' as liquid media and subjected for 3 hours (one yāma) of 'swedana'. Later the drug is washed, dried and stored in airtight container as 'śuddha rājāvarta' for further pharmaceutical use.

### Rājāvarta śodhana- 3rd method:

शिरीषपुष्पस्वरसैः स्वेदितस्तु नृपोपलः । दोलायन्त्रे याममात्रं शुद्धिमायात्यनुत्तमाम् ॥

(R. T. 23/195)

The roughly pounded 'rājāvarta' is tied in a 'poṭṭalī' hung in 'dolāyantra' containing 'śirīṣa puṣpa swarasa' as liquid media and subjected for 3 hours (one yāma) of 'swedana'. Later the drug is washed, dried and stored in airtight container as 'śuddha rājāvarta' for further pharmaceutical use.

### Rājāvarta māraṇa:

लुङ्गाम्बुगन्धकोपेतो राजावर्तो विचूर्णितः । पुटनात्सप्तवारेण राजावर्त्तो मृतो भवेत् ॥ (R. R. S. 4/9)

Required quantity of 'śuddha rājāvarta' is taken in a clean khalva yantra. It is added with equal ratio of 'śuddha gandhaka' and triturated to obtain a homogenous mixture.

This mixture is added with required quantity of 'nimbū swarasa', triturated thoroughly and later dried under hot sun. The dry powder obtained is enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'. This entire procedure is repeated for 7 times to obtain properly prepared 'rājāvarta bhasma'.

### Rājāvarta- piṣṭi:

The fine powder of 'śuddha rājāvarta' is taken in a clean khalva yantra, added with required quantity of 'gulāba jala' (rose water) and triturated thoroughly for 3 days to obtain appropriate 'rājāvarta piṣṭi'.

**Rājāvarta- dosage and adjuvant:**

Half to one rattī (62 mgs to 125 mgs) is the general dosage of 'rājāvarta bhasma'. It is administered along with honey, butter, cream or any other suitble adjuvant depending on the disease condition.

**Rājāvarta bhasma- guṇa:**

> नृपोपल: कटुस्तिक्तो दीपन: पाचनस्तथा । शिशिर: पित्तशमनो बृंहणोऽतिरसायन: ।।
> पाण्डुप्रमेहहरण: क्षयशोषनिबर्हण: । मदात्ययात्ययकरश्छर्दिहिक्कानिवारण: ।। (R. T. 23/199-200)

Properly prepared 'rājāvarta bhasma' possesses kaṭu, tikta rasa; and dīpana, pācana and śīta guṇa. It mitigates vitiated pitta doṣa. Its judicious use for internal administration will improve the body mass (bṛṁhaṇa) and will act as rejuvenator.

It is useful in pāṇḍu roga, prameha roga, kṣaya roga and śoṣa roga. It is also found useful in chronic madātyaya with its complications, chardi roga and hikkā roga.

- Another reference:

> प्रमेहक्षयदुर्नामपाण्डुश्लेष्मानिलापह: । दीपन: पाचनो वृष्यो राजावर्त्तो रसायन: ।। (R. R. S. 4/6)

Properly prepared 'rājāvarta bhasma' is useful in prameha roga, kṣaya roga, arśa roga and pāṇḍu roga. It mitigates vitiated kapha and vāta doṣa. It is good agnidīpaka (appetizer), pācaka (digestive), vṛṣya (aphrodisiac) and rasāyana (rejuvenator).

**Rājāvarta- compound formulations:**

1. Rāmabāṇa rasa
2. Rājāvartāvaleha
3. Sañjīvana rasa
4. Mehahara rasa
5. Tāpyādi vaṭī
6. Trailokyatilaka rasa

### 5. PEROJAKA

(Torquoise)

**Perojaka (torquoise)- general information:**

**Turquoise** is an opaque, blue-to-green mineral that is a hydrous phosphate of copper and aluminium, with the chemical formula $CuAl_6(PO_4)_4(OH)_8 \cdot 4H_2O$. It is rare and valuable in finer grades and has been prized as a gem and ornamental stone for thousands of years owing to its unique hue. In recent times, turquoise, like most other opaque gems, has been devalued by the introduction of treatments, imitations, and synthetics onto the market.

The substance has been known by many names, but the word 'turquoise', which dates to the 16th century, is derived from an Old French word for "Turkish", because the mineral was first brought to Europe from Turkey, from the mines in historical Khorasan Province of Persia. Pliny the Elder referred to the mineral as 'callais', the Iranians named it "pirouzeh" and the Aztecs knew it as 'chalchihuitl'.

**Properties:**

Even the finest of turquoise is fracturable, reaching a maximum hardness of just under 6 or slightly more than window glass. Characteristically acryptocrystalline mineral, turquoise almost never forms single crystals and all of its properties are highly variable. Its crystal system is proven to be triclinic via X-ray diffraction testing.

With lower hardness comes lower specific gravity (2.60-2.90) and greater porosity: These properties are dependent on grain size. The lustre of turquoise is typically waxy to sub vitreous, and transparency is usually opaque, but may be semi translucent in thin sections. Colour is as variable as the mineral is other properties, ranging from white to a powder blue to a sky blue, and from a blue-green to a yellowish green. The blue is attributed to idiochromatic copper while the green may be either the result of iron impurities (replacing aluminium) or dehydration.

The refractive index (as measured by sodium light, 589.3 nm) of turquoise is approximately 1.61 or 1.62; this is a mean value seen as a single reading on a gemological refract meter, owing to the almost invariably polycrystalline nature of turquoise. A reading of 1.61-1.65 (birefringence0.040, biaxial positive) has been taken from rare single crystals. An absorption spectrum may also be obtained with a hand-held spectroscope, revealing a line at 432 nanometers and a weak band at 460 nanometers (this is best seen with strong reflected light). Under long wave ultraviolet light, turquoise may occasionally fluoresce green, yellow or bright blue; it is inert under shortwave ultraviolet and X-rays.

Turquoise is insoluble in all acids except heated hydrochloric acid. Its streak is a pale bluish white and its fracture is conchoidal, leaving a waxy luster. Despite its low hardness relative to other gems, turquoise takes a good polish.

Turquoise may also be peppered with flecks of pyrite or interspersed with dark, spidery limonite veining.

### Perojaka- synonyms and types:

पेरोजकञ्च पेरोजं रसज्ञैः परिकीर्तितम् । भस्माङ्गं हरितं चेति द्विविधं तत प्रकीर्तितम् ॥

(R. T. 23/208)

पेरोजं हरिताश्मा च भस्माङ्गं हरितं द्विधा । (Āy. Pra. 5/148)

Perojaka and peroja are the two words with which this mineral drug is identified. It is of two varieties 1. Bhasmāṅga (ash coloured) and 2. Harita (light green coloured).

### Perojaka śodhana and māraṇa:

शोधनं मारणञ्चैव पेरोजस्य विशेषतः । नृपोपलसमं ख्यातं रसतन्त्रविशारदैः ॥ (R. T. 23/209)

The 'śodhana and māraṇa' methods of 'perojaka' are similar as that of the methods followed for 'śodhana and māraṇa' of 'rājāvarta' (refer above).

### Perojaka- dosage and adjuvant:

Half to one rattī (62 mgs to 125 mgs) is the general dosage of 'perojaka bhasma'. It is administered along with honey, butter, cream or any other suitbale adjuvant depending on the disease condition.

### Perojaka- properties:

पेरोजकं सुतुवरं मधुरं च सुदीपनम् । शूलदूपि विषघ्नञ्च चराचरविषापहम् ॥ (R. T. 23/210)

Perojaka bhasma possesses kaṣāya and madhura rasa. Its internal use improves the appetite and cures all types of 'udara śūla'. It nullifies the influence of all types of 'sthāvara' and 'jāṅgama' viṣa (poisons) over the body.

- Another reference:

पेरोजं सुकषायं स्यान्मधुरं दीपनं सरम् । स्थावरं जङ्गमं चैव संयोगाच्चापि यद्विषम् ॥
तत्सर्वं नाशयेच्छीघ्रं मूलभूतादिदोषजम् ।

(Āy. Pra. 5/148-149)

Perojaka bhasma possesses kaṣāya and madhura rasa. It has agni-dīpana and sara guṇa. It nullifies the influence of sthāvara, jāṅgama and saṁyogaja (kṛtrima) viṣa and is a good laxative.

## 6. SPHAṬIKA MAṆI

(Quartz Crystal; $SiO_2$)

### Sphaṭika (quartz)- general information:

Quartz, rock crystal or pebal is an abundant mineral in the Earth's continental crust. It is made up of a continuous framework of $SiO_4$ 'silicon-oxygen tetrahedra', with each oxygen being shared between two tetrahedra, giving an overall formula $SiO_2$.

There are many different varieties of quartz, several of which are semi-precious gemstones. Throughout the world, varieties of quartz have been, since antiquity, the most commonly used minerals in the making of jewellery and hard stone carvings.

Quartz belongs to the trigonal crystal system. The ideal crystal shape is a six-sided prism terminating with six-sided pyramids at each end. In nature quartz crystals are often twinned, distorted, or so intergrown with adjacent crystals of quartz or other minerals as to only show part of this shape or to lack obvious crystal faces altogether and appear massive.

Well-formed crystals typically form in a 'bed' that has unconstrained growth into a void, but because the crystals must be attached at the other end to a matrix, only one termination pyramid is present. There are exceptions as *doubly terminated* crystals do occur.

### Occurrence:

It is found in all parts of the world. The important sources are Brazil, Switzerland, France and Madagascar. In India, it is found in parts of Rajasthan.

### Sphaṭika maṇi- synonyms:

> स्फटिक: स्फटिकं चैव स्फाटिकं स्फटिकदृषत् । स्फाटिकं स्फटिकाश्मा च तथैव स्फटिकोपल: ।।
> शालीपिष्टं धौतशिलं शिवरत्नं शिवप्रियम् । सितोपलोऽमलमणि: स एव परिकीर्तित: ।।
> (R. T. 23/211-212)

> स्फटिकं सितोपलं स्यादमलमणिनिर्मलोपलं स्वच्छम् ।
> स्वच्छमणिरमलरत्नं निस्तुषरत्नं शिखिप्रियं नवधा ।। (Āy. Pra. 5/136)

Sphaṭika, sphaṭikadṛṣad, sphāṭika, sphaṭikāśmā, sphaṭikopala, śālipiṣṭa (having the colour of rice flour), dhoutaśilā (white coloured), śivaratna and śivapriya; nirmalopala, sitopala, swaccha, swacchamaṇi, nistuṣaratna and śikhipriya; all these are the synonymous words used in the classics for the mineral drug 'sphaṭika maṇi' (quartz).

### Sphaṭika maṇi- brief history:

Sphaṭika maṇi has a long history. In many places of 'Caraka Saṁhitā' and 'Suśruta Saṁhitā', we find its references, where it is used for the purpose of treatment. With the evolution of 'Rasaśāstra', the gemstone was extensively studied, described and used for its therapeutic values.

### Sphaṭika maṇi- grāhya swarūpa:

शीतं स्निग्धं निस्तुषं नेत्रहृद्यं घृष्टं धत्तेस्वच्छतां पूर्वतुल्याम् ।
स्वच्छच्छायं यच्च शुद्धान्तरालं तन्निर्दिष्टं शैवरत्नं तु जात्यम् ॥ (R. T. 23/213)

The 'sphaṭika' maṇi, which possesses snigdha guṇa; which does not have dusty appearance from within (nistuṣa or crystal clear), very much transparent, when rubbed also remains clean, does not have the mixture of any other colour except transparent white; such a sample of 'sphaṭika maṇi' is considered fit and selected for pharmaceutical purposes.

### Sphaṭika maṇi śodhana and māraṇa:

शोधनं मारणञ्चैव शिवरत्नस्य सर्वदा । राजवर्तमणेस्तुल्यं जानीयाद्रसकोविदः ॥ (R. T. 23/214)

The 'śodhana and māraṇa' methods of 'sphaṭika maṇi' are similar as that of the methods followed for 'śodhana and māraṇa' of 'rājāvarta' (refer above).

### Sphaṭika maṇi- piṣṭi:

The fine powder of 'śuddha sphaṭika maṇi' is taken in a clean khalva yantra, added with required quantity of 'gulāba jala' (rose water) and triturated thoroughly for 3 days to obtain appropriate 'sphaṭika maṇi piṣṭi'.

### Sphaṭika maṇi bhasma dosage and adjuvant:

Two to four rattī (250 mgs to 500 mgs) is the general dosage of 'sphaṭika maṇi'. It is administered along with honey, butter, cream or any other suitable adjuvant as per the need.

### Sphaṭika maṇi- properties:

स्फटिको मधुरो वल्यस्तुषारसमशीतलः । रक्तपित्तप्रशमनो ज्वरदाहादिनाशनः ॥ (R. T. 23/215)

A good variety of 'sphaṭika maṇi' possesses madhura rasa. Its judicious internal use in appropriate dosage form improves the physical strength. It is as cold as morning due. It cures 'raktapitta' roga and is useful in pittaja jwara associated with dāha (burning sensation) and tṛṣṇā (thirst).

### Sphaṭika maṇi- compound formulations:

1. Sarvanetra-rogaharāñjana
2. Pittaja-timiraharāñjana
3. Nāgarasāyana
4. Indrokta rasāyana

## 7. VYOMĀṢMA

(Jade or Jadeite)

### Vyomāṣma (jade)- introduction:

**Jade** is an ornamental stone. The term *jade* is applied to two different 'metamorphic rocks' that are made up of different silicate minerals:

1. Nephrite: It consists of a microcrystaline interlocking fibrous matrix of the calcium, magnesium-iron rich amphibole mineral series tremolite (calcium-magnesium)-ferroactinolite (calcium-magnesium-iron). The higher the iron content the greener the colour.
2. Jadeite: It is a sodium- and aluminum-rich pyroxene. The gem form of the mineral is a microcrystalline interlocking crystal matrix.

**Etymology:**

The English word *jade* (alternative spellings "jaid", "jadeite") is derived (via French *l'ejade* and Latin *ilia*) from the Spanish term *piedra de ijada* (first recorded in 1565) or "loin stone", from its reputed efficacy in curing ailments of the loins and kidneys. *Nephrite* is derived from *lapis nephriticus*, the Latin version of the Spanish *piedra de ijada.*

**Nephrite and jadeite:**

Nephrite and jadeite were used from prehistoric periods for hard stone carving. Jadeite has about the same hardness as quartz, while nephrite is somewhat softer. It was not until the 19th century that a French mineralogist determined that "jade" was in fact two different materials.

As metal-working technologies became available, the beauty of jade made it valuable for ornaments and decorative objects. Jadeite possesses hardness of 6.0 and 7.0 and Nephrite between 6.0 and 6.5.

Among the earliest known jade artifacts excavated from prehistoric sites are simple ornaments with bead, button, and tubular shapes. Additionally, jade was used for adze heads, knives, and other weapons, which can be delicately shaped.

**Occurrence:**

It is prominently found in the area of Mogaung in the Myitkyina District of Upper Myanmar. It has been quarried and exported from this place for well over a hundred years.

Canada provides the major share of modern lapidary nephrite. Nephrite jade was used mostly in pre-1800 China as well as in New Zealand, the Pacific Coast and Atlantic Coasts of North America, Neolithic Europe, and Southeast Asia. In addition to Mesoamerica, jadeite was used by Neolithic Japanese and European cultures.

### Vernacular names and physical properties:

| Sanskrit name | Vyomāśma |
|---|---|
| English name | Jade or Jadeite |
| Hindi name | Sangeyaśaba (Houladilī) |
| Chemical formula | $Na\ (Al, Fe)\ Si_2\ O_6$ |
| Specific gravity | 3.33 |
| Hardness | Jadeite- 6 to 7<br>Nephrite- 6 to 6.5 |

### Vyomāśma- brief history:

This mineral has no references in any of the classical texts of Āyurveda. It has been inducted into the books of 'Rasaśāstra' in 20th century from the classical 'Unani system of medicine' books.

### Vyomāśma- types:

Mineralogists identify two varieties of vyomāśma;

1. Jadeite (Abundant in China)
2. Nephrite (Abundant in New Zealand)

### Vyomāśma śodhana:

The pieces of 'vyomāśma' are heated red-hot and dipped in 'arjuna twak kwātha' (or in gulāba jala- rose water). This process of heating and dipping in fresh 'arjuna twak kwātha' is repeated for 21 times to obtain 'śuddha vyomyāṣma'.

### Vyomāśma māraṇa:

The 'śuddha vyomāśma' is taken in a clean khalva yantra. It is added with required quantity of 'arjuna twak kwātha' or 'ghṛtakumārī swarasa' and triturated thoroughly to prepare cakrikās of even size and shape.

These cakrikās are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'. All this procedure is repeated 10 times to obtain vyomāśma bhasma.

### Vyomāśma piṣṭi:

The 'śuddha vyomāśma' is taken in a clean khalva yantra. It is added with required quantity of 'gulāba jala' (rose water) and triturated thoroughly for three days to obtain, white coloured 'vyomāśma piṣṭi'.

### Vyomāśma bhasma and piṣṭi- dosage and adjuvant:

- Vyomāśma bhasma: 2 to 4 rattī (250 to 500 mgs)
- Vyomāśma piṣṭi: 2 to 8 rattī (250 mgs to 1 gm)

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Adjuvant: It is administered along with honey, sugar, cream, arjuna twak kwātha, rose water.

**Vyomāśma- properties:**

Śuddha bhasma or piṣṭi possess rūkṣa and śīta guṇa and śīta vīrya. It mitigates vitiated pitta doṣa. When administered in suitable dosage along with appropriate adjuvant, it acts as a good cardio tonic (hṛdya). It is also found beneficial in hypertension, insomnia and in intestinal wounds.

**Vyomāśma- compound formulations:**

1. Hṛdwepanādi cūrṇa
2. Brāhmī vaṭī
3. Jawāharamoharā vaṭī

### 8. TṚṆAKĀNTA

(Amber)

**Tṛṇakānta (amber)- introduction:**

**Amber** is fossilized tree resin (not sap), which has been appreciated for its color and natural beauty since Neolithic times. Amber is used as an ingredient in perfumes, as a healing agent in folk medicine and as 'jewellery'.

There are five classes of amber, defined on the basis of their chemical constituents. Because it originates as a soft, sticky tree resin, amber sometimes contains animal and plant material as inclusions. Amber occurring in coal seams is also called **resinite**, and the term ambrite is applied to that found specifically within New Zealand coal seams.

**History and etymology:**

The English word *amber* derives from the Arabic *ambar*, via Medieval Latin *ambar* and Old French *ambre*. The word originally referred to a solid waxy substance derived from the sperm whale (now called ambergris). The sense was extended to fossil resin circa 1400, and this became the main sense, as the use of ambergris waned. The two substances were confused, because they both were found washed up on beaches.

Ambergris is less dense than water and floats, whereas amber is less dense than stone, but too dense to float. The word *ambar* was brought to Europe by the Crusaders. In French *ambre gris* (lit. grey amber), became used for ambergris, while *ambre jaune* (yellow amber), denoted the fossil resin we now call amber.

**Distribution and mining:**

Amber is globally distributed, mainly in rocks of Cretaceous age or younger. Historically, the coast around Kūnigsberg in Prussia was the world's leading source of amber. About 90% of the world's extractable amber is still located in the Kaliningrad Oblast of Russia on the Baltic Sea.

**Appearance:**

Amber occurs in a range of different colors. As well as the usual yellow-orange-brown that is associated with the color "amber", amber itself can range from a whitish color through a pale lemon yellow to brown and almost black.

Other more uncommon colors include red amber (sometimes known as "cherry amber"), green amber, and even blue amber, which is rare and highly sought after.

Much of the most highly prized amber is transparent, in contrast to the very common cloudy amber and opaque amber. Opaque amber contains numerous minute bubbles. This kind of amber is known as "bony amber".

Although all Dominican amber is fluorescent, the rarest Dominican amber is blue amber. It turns blue in natural sunlight and any other partially or wholly ultraviolet light source. In long-wave UV light it has a very strong reflection, almost white. Only about 100 kg is found per year, which makes it valuable and expensive.

**Uses:**

Amber has been used since antiquity in the manufacture of jewellery and ornaments, and also in folk medicine. Amber also forms the flavoring for akvavit liquor. Amber has been used as an ingredient in perfumes.

Jewellery: Amber has been used since the stone age, from 13,000 years ago. Amber ornaments have been found in Mycenaean tombs and elsewhere across Europe. To this day it is used in the manufacture of smoking and glassblowing mouthpieces. Amber's place in culture and tradition lends it a tourism value; Palanga Amber Museum is dedicated to the mineral.

Historic medicinal uses: Amber has long been used in folk medicine for its purported healing properties. Amber and extracts were used from the time of Hippocrates in ancient Greece for a wide variety of treatments through the Middle Ages and up until the early twentieth century.

**Vernacular names and physical properties:**

| | |
|---|---|
| Sanskrit name | Tṛṇakānta (No other synonyms) |
| Latin name | Succinum |
| English name | Amber |
| Hindi name | Tṛṇakānta |
| Chemical formula | $C_{10}H_{16}O_4$ |
| Specific gravity | 1.08 |
| Hardness | 2.5 |
| Refractive index | 1.54 to 1.55 |

**Tṛṇakānta (amber)- brief history:**

This mineral has no references in any of the classical texts of Āyurveda. It has been inducted into the books of 'Rasaśāstra' in 20th century from the classical 'Unani system of medicine' books. Its details are found in 'Rasāmṛta' of Ācārya Yādavji Trikamji.

**Tṛṇakānta śodhana and māraṇa:**

Its purification and incineration is not in practice and has no textual references. Instead, it is used in the form of 'piṣṭi' for internal administration.

**Tṛṇakānta piṣṭi:**

The 'śuddha tṛṇakānta' is taken in a clean khalva yantra. It is added with required quantity of 'gulāba jala' (rose water) and triturated thoroughly for three days to obtain pale white coloured 'tṛṇakānta piṣṭi'.

**Tṛṇakānta piṣṭi- dosage and adjuvant:**

One to two māṣa (1 to 2 gms) is the general dosage of 'tṛṇakānta piṣṭi'.

Adjuvant: It is administered along with honey, sugar or cream.

**Tṛṇakānta - properties:**

Tṛṇakānta piṣṭi possesses rūkṣa and śīta guṇa and śīta vīrya. It mitigates vitiated pitta doṣa. When administered in suitable dosage along with appropriate adjuvant, it acts as hṛdya (cardio tonic), indriya prasādana, grāhī and raktasthambhaka.

It is indicated in raktapitta, raktārśas, raktātisāra, raktaṣṭīvana and hṛdayadourbalya. It has been claimed that, by wearing the garland of this mineral gemstone, the chances of abortion will be minimized.

**Tṛṇakānta - compound formulations:**

1. Brāhmī vaṭī
2. Jawāharamoharā vaṭī

## 9. PALAṄKA

(Onyx)

**Palaṅka (onyx)- Introduction:**

**Onyx** is a banded variety of chalcedony. The color of its bands range from white to almost every color (save some shades, such as purple or blue). Commonly, specimens of onyx contain bands of black and/or white.

**Etymology:**

*Onyx* comes through Latin and from Greek, which means "claw" or "fingernail". With its flesh tone color, onyx can be said to resemble a fingernail. The English word "nail" is cognate with the Greek word.

**Historical usage:**

Onyx has a long history of use for hard stone carving and jewellery, where it is usually cut as a cabochon or into beads. It has also been used for intaglio and hard stone cameo engraved gems, where the bands make the image contrast with the ground. Some onyx is natural but much of the material in commerce is produced by the staining of agate.

Onyx was used in Egypt as early as the Second Dynasty to make bowls and other pottery items. Use of sardonyx appears in the art of Minoan Crete, notably from the archaeological recoveries at Knossos. Onyx is also mentioned in the Bible at various points, such as in Genesis 2:12 "and the gold of that land is good—there is bdellium and the onyx stone", and such as the priests' garments and the foundation of the city of Heaven in Revelation.

Onyx was known to the Ancient Greeks and Romans. The first-century naturalist Pliny the Elder described both type of onyx and various artificial treatment techniques in his *Naturalis Historia.*

**Mineralogical properties:**

| | |
|---|---|
| Sanskrit name | Palaṅka (no other synonyms) |
| English name | Onyx |
| Family | Chalcedony |
| Chemical name and formula | Silicon dioxide ($SiO_2$) |
| Specific gravity | 2.65 to 2.667 |
| Hardness | 7 |
| Refractive index | 1.543-1.552 to 1.545-1.554 |
| Birefringence | 0.009 |

**Palaṅka (onyx)- types:**

Depending on colour, it has been divided into 3 types:

1. Black
2. Yellowish black
3. Grey

**Palaṅka (onyx)- śodhana, māraṇa and piṣṭi:**

There are no references for the purification, incineration, piṣṭi preparation, medicinal properties and usage of 'palaṅka' (onyx). It has been used as ornamental gemstone and is a replacement for 'emerald' (tārkṣya or marakata).

### 10. PUTTIKA

(Peridot)

**Puttika (peridot)- introduction:**

**Chemistry:**

The chemical composition of peridot is $(Mg, Fe)_2SiO_4$, with Mg in greater quantities than Fe.

**Etymology:**

The origin of the name "peridot" is uncertain. The *Oxford English Dictionary* suggests it as a kind of opal, rather than the Arabic word *faridat*, meaning "gem".

**Appearance:**

Peridot is one of the few gemstones that occur in only one color, an 'olive green'. The intensity and tint of the green, however, depends on how much iron is contained in the crystal structure, so the color of individual peridot gems can vary from yellow- to olive- to brownish-green. The most valued color is a dark olive-green.

**Confusion with other gems:**

It is sometimes mistaken for 'emeralds' and other 'green gems'. In fact notable gemologist George Frederick Kunz discussed the confusion between emeralds and peridots in many church treasures, notably the "Three Magi" treasure in the Dom of Cologne, Germany.

**Geologically:**

Olivine, of which peridot is a type, is a common mineral in mafic and ultramafic rocks, and it is often found in lavas and in peridotite xenoliths of the mantle, which lavas carry to the surface; but gem quality peridot only occurs in a fraction of these settings. Peridot can be also found in meteorites.

**Abundance and locations of occurrence:**

Olivine in general is a very abundant mineral, but gem quality peridot is rather rare. This mineral is precious. Peridot olivine is mined in Egypt, North Carolina, Arizona on the San Carlos Reservation, Hawaii, Nevada, and New Mexico at Kilbourne Hole, in the US; and in Australia, Brazil, China, Kenya,Mexico, Myanmar, Norway, Pakistan, Saudi Arabia, South Africa, Sri Lanka, and Tanzania.

High quality peridot was also recovered from anthills and in lamproite in the Leucite Hills of Wyoming. While searching for diamonds in the Leucite Hills, Dan Hausel recovered 13,000 carats of peridot from two anthills located near the Black Rock lamproite.

**In meteorites:**

Peridot crystals have been collected from some Pallasite meteorites. A famous Pallasite was offered for auction in April 2008 with a requested price of close to $3 million at Bonhams, but remained unsold.

**Records:**

The largest cut peridot olivine is a 310 carat (62 g) specimen in the Smithsonian Museum in Washington, D.C.

**Mineralogical properties:**

| | |
|---|---|
| Sanskrit name | Puttika |
| Synonyms | Haritamaṇi, dṛtimaṇi, haritopala |
| English name | Peridot |
| Chemical formula | $(MgFe)_2\,SiO_4$ |
| Specific gravity | 3.34 |
| Hardness | 6.5 |
| Refractive index | 1.64 to 1.69 |

**Puttika (peridot)- types:**

Depending on colour, it has been divided into 2 types:

1. Olivine (dark green coloured)
2. Chryosolite (yellowish green)

**Puttika (peridot)- śodhana, māraṇa and piṣṭi:**

There are no references for the purification, incineration, piṣṭi preparations, medicinal properties and usage of 'peridot'. It has been used as ornamental gemstone.

## 11. RUDHIRA

(Carnelian)

### Rudhira (carneline)- introduction:

**Carnelian** (also spelled **cornelian**) is a brownish-red mineral which is commonly used as a semi-precious gemstone. Similar to carnelian is **'sard'**, which is generally harder and darker. (The difference is not rigidly defined, and the two names are often used interchangeably.)

Both 'carnelian' and 'sard' are varieties of the silica mineral chalcedony colored by impurities of iron oxide. The color can vary greatly, ranging from pale orange to an intense almost-black coloration.

### Etymology:

Although now the more common term, "carnelian" is a 16th century corruption of the 14th century word "cornelian" (and its associated orthographies corneline and cornalyn). Cornelian, cognate with similar words in several Romance languages, comes from the Mediaeval Latin *corneolus*, itself derived from the Latin word *cornum*, the cornel cherry,whose translucent red fruits resemble the stone.

The *Oxford English Dictionary* calls "carnelian" a perversion of "cornelian", by subsequent analogy with the Latin word *caro, carnis*, flesh. According to Pliny the Elder, sard derives its name from the city of Sardis in Lydia, but it more likely comes from the Persian word '*sered*', meaning yellowish-red.

### History:

The bow drill was used to drill holes into carnelian in Mehrgarh between 4th-5th millennium BC. Carnelian was recovered from Bronze Age Minoan layers at Knossos on Crete in a form that demonstrated its use in decorative arts; this use dates to approximately 1800 BC.

Carnelian was used widely during Roman times to make 'engraved gems' for signet or seal rings for imprinting a seal with wax on correspondence or other important documents. Hot wax does not stick to carnelian. Sard was used for Assyrian cylinder seals, Egyptian and Phoenician scarabs and early Greek and Etruscan gems.

### Occurrence:

Best carneline is found in India.

**Mineralogical properties:**

| | |
|---|---|
| Sanskrit name | Rudhira |
| Synonym | Raktanakhita |
| English name | Carneline |
| Family | Chalcedony |
| Chemical formula | $SiO_2$ |
| Specific gravity | 2.61 |
| Hardness | 7.0 |
| Refractive index | 1.53 |

**Rudhira (carneline)- types, śodhana, māraṇa and piṣṭi:**

There are no references for the types, purification, incineration, piṣṭi preparations, medicinal properties and usage of 'carneline'. It has been used as ornamental gemstone.

❋

## Chapter 21
# SUDHĀ VARGA DRAVYA

The term 'sudhā' here means 'limestone'. All the drugs, which prominently contain 'calcium' are enlisted under the heading 'sudhā varga'. This group is called as 'śukla varga' in classics. In this regard, we find two classical references;

शुक्लवर्गः सुधाकूर्मशंखशुक्तिवराटिका ।। (Rasārṇava 5/40)
चुन्नं कूर्मं शंखशुक्तिवराटैः शुक्लवर्गकः ।। (Rasaratnākara 2/6)

Only five drugs of 'śuklavarga' are included in each of the references given above. However, the drugs, which contain 'calcium', are obviously more than five in the field of 'Rasaśāstra'. They come from mineral, animal and plant sources. All those drugs that containing calcium (total 15) can be enlisted as below in alphabetical order;

1. Ajāsthi (Goat's bone)
2. Badarāśma (Silicate of lime)
3. Godantī (Gypsum)
4. Khaṭikā (Chalk)
5. Kukkuṭāṇḍa twak (Hen's egg shell)
6. Mṛgaśṛṅga (Antlers)
7. Muktā (Pearl)
8. Pravāla (Coral)
9. Śambūka (Pilā)
10. Śaṅkha (Conch shell)
11. Śukti (Oyster shell)
12. Samudraphena (Cuttle fish bone)
13. Sudhā (Quick Lime)
14. Vaṁśalocana (Bamboosa arundinacea)
15. Varāṭikā (Cowry)

Based on source, these drugs can be categorized and enlisted as below;

| NATURAL SOURCES OF CALCIUM | | |
|---|---|---|
| **Mineral source** | **Animal source** | **Plant source** |
| 1. Badarāśma (Silicate of lime)<br>2. Godantī (Gypsum) | 1. Ajāsthi (Goat's bone)<br>2. Kukkuṭāṇḍa twak (Hen's egg shell) | 1. Vaṁśalocana (Bamboosa arundinacea) |
| 3. Khaṭikā (Chalk)<br>4. Sudhā (Quick lime) | 3. Mṛgaśṛṅga (Antlers)<br>4. Muktā (Pearl)<br>5. Pravāla (Coral)<br>6. Śambūka (Pilā) | |
| | 7. Śaṅkha (Conch shell)<br>8. Śukti (Oyster shell) | |

| Mineral source | Animal source | Plant source |
|---|---|---|
|  | 1. Samudraphena (Cuttle fish bone)<br>2. Varāṭikā (Cowry) |  |

The names of all these fifteen 'sudhāvarga dravya' can be recollected easily by memorizing the below self constructed verse;

बदराश्मश्च गोदन्ती खटिकाचूर्णकस्थता । अजास्थिमुक्ताशम्बूकशङ्खशुक्तिवराटिका ।।
समुद्रफेनो शृङ्गश्च प्रवालो वंशलोचनः । सुधावर्ग इति ख्यातो तथा च कुक्कुटाण्डत्वक् ।।

The 'sudhāvarga dravya' that are specified for the under graduation and post graduation syllabus are;

1. Sudhā cūrṇa (Calcium carbonate; $CaCO_3$)
2. Varāṭikā (Kaparda) (Cowry)
3. Śukti (Oyster shell or Pearl oyster)
4. Śaṅkha (Conch shell)
5. Śambūka (Pila/Snail shell)
6. Mṛga-śṛṅga (Antelers/Hart's horn/Deer horn)
7. Khaṭikā (Chalk or Pipe clay)
8. Godantī (Gypsum)
9. Samudraphena (Cittle fish bone)
10. Kukkuṭāṇḍa twak (Hen's Egg Shell)
11. Kūrmapṛṣṭhāsthi (Tortoise bone)
12. Ajāsthi (Goat's bone)
13. Śwetāñjana (Calcite)

### 1. SUDHĀ CŪRṆA

(Calcium carbonate; $CaCO_3$)

**Sudhā (calcium carbonate)- introduction:**

Sudhā is 'calcium carbonate' with the formula $CaCO_3$. It has specific gravity of 1.55. It is a common substance found in rocks in all parts of the world, and is the main component of shells of marine organisms, snails, coal balls, pearls and eggshells.

The vast majority of calcium carbonate used in industry is extracted by mining or quarrying. Pure calcium carbonate (e.g. for food or pharmaceutical use), can be produced from a pure quarried source (usually marble).

**Geological sources:**

Calcite, Aragonite and Vaterite are pure calcium carbonate minerals. Other industrially important source minerals, which are predominantly calcium carbonate, include Limestone, Chalk, Marble and Travertine.

**Biological sources:**

Eggshells, Snailshells and most Seashells are predominantly calcium carbon-

dr keshav raj

ate and can be used as industrial sources of that chemical. Oyster shells are recently a prominent source of dietary calcium.

**Health and dietary use:**

Calcium carbonate is widely used medicinally as an inexpensive dietary calcium supplement or gastric antacid. It may be used as a phosphate binder for the treatment of hyperphosphatemia (primarily in patients with chronic renal failure). It is also used in the pharmaceutical industry as inert filler for tablets and other pharmaceuticals.

Calcium carbonate is known among IBS (Irritable bowel syndrome) sufferers to help reduce diarrhea. Some individuals report being symptom-free since starting supplementation. The process in which calcium carbonate reduces diarrhea is by binding water in the bowel, which creates a stool that is firmer and better formed. Calcium carbonate supplements are often combined with magnesium in various proportions. This should be taken into account as magnesium is known to cause diarrhea.

Calcium carbonate is used in the production of toothpaste and has seen a resurgence as a food preservative and color retainer, when used in or with products such as organic apples or food.

Excess calcium from supplements, fortified food and high-calcium diets, can cause the milk-alkali syndrome, which has serious toxicity and can be fatal.

**Sudhā (cūrṇa)- synonyms:**

चूर्णं चूर्णकचूर्णन्तु सुधा सौधविलेपनम् । तदैव च समाख्यातं शिलाक्षारं भिषग्वरैः ॥

(R. T. 11/215)

Cūrṇa, cūrṇaka, sudhā, soudhavilepana and śilā-kṣāra; are the synonymous words used for 'Calcium carbonate' ($CaCO_3$) in classics.

**Occurrence:**

From mineral source, the quick lime is obtained from all parts of India. The calcium of animal source comes largely from sea.

**Cūrṇodaka (lime water) nirmāṇa:**

रक्तिद्वयोन्मितं चूर्णं पञ्चतोलकसंमिते । जले विनिक्षिपेत्प्राज्ञस्त्रियामं स्थापयेद् बुधः ॥
ततः सारकपत्रेण सारयेत्काचपात्रके । चूर्णोदकमिति ख्यातं तथैव च सुधोदकम् ॥
चूर्णोदकं दृढहरित्काचकुप्यां निधापयेत् । तथातिसंयतेनेह पिधानेन निरोधयेत् ॥

(R. T. 11/216-218)

Two rattī (250 mgs) of cūrṇa (sudhā) is added with 5 tola (60 ml) of water and left undisturbed for three yāma (9 hours). Later the liquid is filtered through a filter paper into a glass bottle. It is later labelled as 'cūrṇodaka' and stored.

The glass bottle should be preferably strong and amber coloured. It should be very tightly closed. If the bottle is kept open or the liquid is frequently exposed to atmospheric conditions, the 'cūrṇodaka' loses its sharpness.

**Cūrṇodaka- mātrā:**

आरभ्य त्रिंशद्विन्दुभ्यः षष्ठिविन्दुमितं परम् । चूर्णोदकं प्रयुञ्जीत वार्षिकैकस्तनन्धये ।।
चूर्णोदकस्य सुखदा तोलकद्वयसंमिता । पूर्णमात्रा समाख्याता रसतन्त्रविशारदैः ।।

(R. T. 11/221-222)

For children aged one year, the dosage of 'cūrṇodaka' is 30 drops to 60 drops. Its adult dosage is two tola (24 ml). The dosage has to be carefully decided considering the withstanding capacity of the person and the strength of the disease.

**Cūrṇodaka- properties:**

चूर्णोदकं कृमिहरमतीसारहरं परम् । अम्लपित्तप्रशमनं विशेषादुग्धपाचनम् ।।
शूलं ग्रहणिकां हन्ति खटीवद् गुणकारकम् । द्रावकाशनसंभूतां निहन्ति च विषक्रियाम् ।।

(R. T. 11/219-220)

Cūrṇodaka used for internal as well as external purposes will be 'kṛmināśaka' in its properties. It is beneficial to cure atisāra and amlapitta roga. In the children with lactose intolerance (who do not digest the breast milk), few drops of 'cūrṇodaka' will correct the digestion process. It cures 'udara śūla' and 'grahaṇī' roga. It is therapeutically efficient as 'khaṭikā'. Its judicious use brings down the toxic effects of 'gandhakāmla' (sulphuric acid; $H_2SO_4$).

**Cūrṇodaka- āmayika prayoga:** (R. T. 11/223-229)

1. Cūrṇodaka when carefully used as basti dravya, it alleviates 'kṛmi' of anal and intestinal regions.
2. To bring down the toxic effects of scorpion bite, the 'cūrṇodaka' is added with 'navasādara' (Ammonium chloride; $NH_4Cl$) and the solution is applied on the bitten part.
3. In case of arsenic poisoning, the intake of 'cūrṇodaka' will bring down the toxic influence.
4. The 'cūrṇodaka' judiciously administered along with 'milk' will cure 'amlapitta' roga.

5. The daily gargling done with 'cūrṇodaka' will cure stomatitis and wounds in oral cavity.
6. One tola (12 ml) of 'cūrṇodaka' is taken in a glass bottle. It is added with equal quantity of 'atasī taila'. The mixture is stirred for a while to obtain a thick solution. This solution is applied over the burnt areas (agni-dagdha vraṇa) to bring down the burning sensation and to cure the wound.

### 2. VARĀṬIKĀ (KAPARDA)

(Cowry)

Note: Since this drug is counted among the 'sādhāraṇa rasa dravya' (17th chapter), it has been dealt in detail earlier in this book. Kindly refer the same.

### 3. ŚUKTI

(Oyster shell or Pearl oyster)

**Śukti (oyster)- introduction:**

The word **oyster** is used as a common name for a number of distinct groups of bivalve molluscs which live in marine or brackish (saline) habitats. The valves are highly calcified. Chemically they are Calcium Carbonate ($CaCO_3$).

Some kinds of oyster are commonly consumed, cooked or raw, by humans. These are considered an aphrodisiac. Other kinds, such as pearl oysters, are not eaten by humans, though they are edible.

Almost all shell-bearing molluscs can secrete pearls, yet most are not very valuable. Pearl oysters are not closely related to true oysters, being members of a distinct family, the *feathered oysters* (Pteriidae). Both cultured pearls and natural pearls can be obtained from pearl oysters, though other molluscs, such as the freshwater mussels, also yield pearls of commercial value.

The largest pearl-bearing oyster is the marine *Pinctada maxima*, which is roughly the size of a dinner plate. Not all individual oysters produce pearls naturally. In fact, in a harvest of three tons of oysters, only three to four oysters produce perfect pearls.

In nature, pearl oysters produce natural pearls by covering a minute invading parasite with nacre, not by ingesting a grain of sand. Over the years, the irritating object is covered with enough layers of nacre to become a pearl. There are many different types, colours and shapes of pearl; these qualities depend on the natural pigment of the nacre, and the shape of the original irritant.

Pearl farmers can culture a pearl by placing a nucleus, usually a piece of polished mussel shell, inside the oyster. In three to six years, the oyster can produce a perfect pearl. These pearls are not as valuable as natural pearls, but look exactly the same. In fact, since the beginning of the 20th century, when several researchers discovered how to produce artificial pearls, the cultured pearl market has far outgrown the natural pearl market.

**Nutritional and therapeutic value:**

Oysters are an excellent source of zinc, iron, calcium, selenium as well as Vitamin A and Vitamin $B_{12}$. Oysters are low in food energy; one dozen raw oysters contain approximately 110 kilocalories. Oysters are considered the healthiest when eaten raw on the half shell.

Traditionally, oysters were considered to be an aphrodisiac. A team of American and Italian researchers analyzed bivalves and found they were rich in amino acids that trigger increased levels of sex hormones. Their high zinc content aids the production of testosterone.

Dietary supplements may contain calcium carbonate from oyster shells, though there is no evidence that this offers any benefits beyond what calcium may offer.

**Śukti- synonyms:**

> शुक्तिश्च शुक्तिका चापि मुक्तामाता तथैव च । मुक्तागृहं महाशुक्तिः मौक्तिकप्रसवा च सा ।।
> मुक्ताशुक्तिस्तथा मुक्तागेहं मौक्तिकमन्दिरम् ।
> (R. T. 12/64-65)
> जलशुक्तिर्वारिशुक्तिः कृमिभूः क्षुद्रशुक्तिका । शम्बूका जलडिम्बश्च पुटिका तोयशुक्तिका ।।
> (Āy. Pra. 2/328)

Śukti, śuktikā, muktāmatā, muktā-gṛha, mahā-śukti, mouktika-prasavā, muktā-śukti, muktā-geha and mouktika-mandira; jala-śukti, vāri-śukti, kṛmibhū, kṣudra-śukti, śambūka, jalaḍimba, puṭika and toya-śukti; all these are the synonymous words with which this drug is identified in the classics.

**Śukti- brief history:**

Since 'Saṁhitā period', the 'śukti' is used for pharmaceutical as well as therapeutic purposes. Its references may be readily traced from 'Caraka Saṁhitā', 'Suśruta Saṁhitā', 'Aṣṭāṅga Saṅgraha' and 'Aṣṭāṅga Hṛdaya'.

Rasārṇava and Rasaratnakāra have included the drug in 'śuklavarga' and dealt in detail about the drug. Its elaboration can be traced from 12th chapter of 'Rasataraṅgiṇī'.

### Śukti- types:

1. Muktā śukti (Pearl oyster): The śukti, which forms the pearl in it.
2. Jala śukti (oyster): The one, which does not form pearl in it.

### Muktā-śukti śodhana- 1st method:

जयन्त्याः स्वरसेनैव शुक्तिं दोलागतां पचेत् ।। यामैकेनैव नियतं शुक्तिः शुद्धिमवाप्नुयात् ।

(R. T. 12/65-66)

The bigger sized 'śukti' are selected. Their posterior surface is scraped with a sharp knife to clean the ocean's alkaline deposits. These cleaned 'śukti' are tied in a cloth like poṭṭalī, hung in a 'dolāyantra' containing 'jayantī swarasa' as liquid media and subjected for swedana of one yāma (3 hours). Later, the drug in the cloth is washed with water, dried and stored as 'śuddha śukti'.

### Muktā-śukti śodhana- 2nd method:

अम्लेन केनचिद्वापि दोलायन्त्रेण यत्नतः ।।
शुक्तिकां पाचयेद्धीमान् शुद्धिमायात्यनुत्तमाम् । (R. T. 12/66-67)

The bigger sized 'śukti' are selected. Their posterior surface is scraped with a sharp knife to clean the ocean's alkaline deposits. These cleaned 'śukti' are tied in a cloth like poṭṭalī, hung in a 'dolāyantra' containing 'kāñjī' or any other 'amla dravya' as liquid media and subjected for swedana of one yāma (3 hours). Later, the drug in the cloth is washed with water, dried and stored as 'śuddha śukti'.

### Muktā-śukti māraṇa:

शुक्तिकां खण्डशः कृत्वा सम्पुटस्थां ततः पुटेत् ।। हिमकुन्देन्दुसङ्काशां शुक्तेर्भूतिं समाहरेत् ।

(R. T. 12/67-68)

The pieces of 'śuddha śukti' are enclosed in 'śarāva sampuṭa' and subjected for one 'gajapuṭa'. When cool on its own, the white coloured bhasma inside the sampuṭa is collected, triturated and stored in airtight container as 'śukti bhasma'.

Note: To obtain very smooth and more potent 'śukta bhasma', another 'śukta māraṇa' method is adopted. Here, in a wider śarāva, one part of 'kumārī pulp' is taken. Above that half part of 'śuddha śukta' pieces are spread. Above these, again, one part of 'kumārī pulp' is put and earlier śarāva is closed and sealed with another śarāva from above to make 'śarāva sampuṭa'.

This sampuṭa is subjected for one 'gajapuṭa'. When cool on its own, the bhasma obtained is taken in a clean khalva yantra and subjected for 3 hours of trituration with 'nimbū swarasa'. Later the powder is again enclosed in 'śarāva sampuṭa' and subjected for another 'gajapuṭa' to obtain very smooth and potent 'śukti bhasma'.

**Muktā-śukti bhasma- dosage and adjuvant:**

रक्तिद्वयमिता मात्रा सुक्तागेहस्य कीर्तिता ॥ (R. T. 12/70)

The dosage of 'śukti bhasma' is two rattī (250 mgs). However, the dosage should be finalized after thorough consideration of patient and disease strength.

Adjuvant: It is usually administered along with honey, ghee or milk.

**Muktā-śukti bhasma- properties:**

शुक्तिका शूलशमनी हृदामयविनाशिनी ॥
स्निग्धा रुच्या श्वासहरा दीपनी मधुरा मता । इष्टिकावर्णसङ्काशां नाशयेन्मूत्रशर्कराम् ॥
प्लीहानं नाशयत्याशु तथा च जठरामयान् । (R. T. 12/68-70)

Appropriately prepared 'śukti bhasma' is beneficial in curing 'udara śūla' and 'hṛdaya śūla'. It is snigdha and rucikāraka. Its judicious use cures chronic 'śwāsa roga' and improves the appetite. It has madhura rasa. It is helpful in curing 'mūtra śarkarā' where patient passes brick coloured urine. It is useful in 'plīhā roga' and 'udararoga'.

**Śukti- āmayika prayoga:** (R. T. 12/71-78)

1. To cure all types of 'śūla roga', the 'śukti bhasma' is administered daily in suitable dosage along with the fine powders of 'triphalā' and 'trikaṭu'.
2. To cure 'hṛdroga', the 'śukti bhasma' is added with 'āmalakī cūrṇa' and administered daily in suitable dosage along with 'kākamācī swarasa'.
3. To cure 'śwāsa roga', the 'śukti bhasma' is added with 'trikaṭu cūrṇa' and administered daily for a week in suitable dosage along with 'honey' and 'vāsā swarasa'.
4. To improve the appetite, the 'śukti bhasma' is administered daily in suitable dosage along with 'honey'.
5. To cure 'mūtra-śarkarā', the 'śukti bhasma' is administered daily in suitable dosage along with decoction of 'tṛṇa pañcamūla'.
6. In 'plīhā vṛddhi', the 'śukti bhasma' is added with the fine powders of 'trikaṭu', 'yavakṣāra', 'saindhava lavaṇa' and 'souvarcala lavaṇa' in equal quantities and administered daily in suitable dosage along with 'honey'.
7. To cure 'śweta pradara', the 'śukti bhasma' is added with the fine pow-

ders of 'śilājatu', 'vaṅga bhasma' and 'sarja rasa' in equal quantities and administered daily in suitable dosage along with pulp of 'ghṛta kumārī'.

8. To cure all types of 'udara roga', the 'śukti bhasma' is added with the fine powders of 'yavakṣāra' and 'saindhava lavaṇa' in equal quantities and administered daily in suitable dosage along with 'godadhi' (curd).
9. To cure 'amlapitta' roga, the 'śukti bhasma' is administered daily in suitable dosage along with the fine powders of 'swarṇa mākṣika' and 'yavakṣāra' in equal quantities.

## JALAŚUKTI

### Jalaśukti- synonyms:

जलशुक्तिस्तथा क्षुद्रशुक्तिका तोयशुक्तिका । कृमिशुक्तिश्च शम्बूका पुष्टिका ह्रस्वशुक्तिका ।।
(R. T. 12/79)

Jalaśukti, kṣudra-śukti, toya-śukti, kṛmi-śukti, śambūka, puṣṭikā and hṛswa-śuktkā; all these are the synonymous words with which this drug is identified in the classics.

### Jalaśukti- śodhana and māraṇa:

शुक्तिवच्छोधनं तस्या मारणञ्चापि कीर्तितम् । अङ्गारग्नौ तु वा न्यस्य मारयेद्वारिशुक्तिकाम् ।।
(R. T. 12/80)

The purification and incineration of 'jalaśukti' is same as that of 'śukti' (explained above). Alternatively, the incineration of this drug is done by placing the 'śuddha śukti' over glowing charcoal. When the drug becomes brittle and light weighted because of heat, it is collected, triturated and stored as 'jalaśukti bhasma'.

### Jalaśukti- properties:

जलशुक्तिः शूलहरा कटुः स्निग्धा च दीपनी । बल्या गुल्महरा रुच्या विषदोषहरा मता ।।
(R. T. 12/81)

The appropriately prepared 'jalaśukti bhasma' is a good reliever of pain (śūlahara). It has 'kaṭu' rasa, 'snigdha' guṇa and is a good appetizer. Its judicious use strengthens the person and cures 'gulma roga'. It is 'rucikāraka' and nullifies the influence of viṣa.

## 4. ŚAṄKHA

(Conch shell)

### Śaṅkha (conch shell)- introduction:

**Conch** is a common name that is applied to a number of different medium to large-sized 'sea snails' or their 'shells'. The term generally applies to large sea snails that have a high spire and a siphonal canal (comes to a point at both ends of the shell).

True conches are 'marine gastropod molluscs' in the **family** 'Strombidae', specifically in the genus ***Strombus*** and other closely related **genera** such as *Eustrombus*. Chemically it is Calcium Carbonate ($CaCO_3$).

**Vernacular names:**

The word śaṅkha is spelt differently in India from one region to another according to the language used there. It is spelled śaṅkha in Sanskrit, Kannada and Marathi. In English it is usually known as a 'conch' or 'conch shell', but also as a "chank" shell. In Gujarati it is known as 'du-sukk', 'sanka' and 'canku' in Tamil, 'senkham' in Telugu, 'sankha' in Oriya and 'śankho' in Bengali.

**Description:**

Śaṅkha's scientific name is '*Turbinella pyrum*'. It is a porcelaneous shell (i.e. the surface of the shell is strong, hard, shiny, and somewhat translucent, like porcelain). The sea snail, which forms the shell, is found in the Indian Ocean and surrounding seas.

The overall shape of the main body of the shell is oblong or conical. In the oblong form, it has a protuberance in the middle but tapers at each end. In the conical variety, the upper portion is corkscrew shaped, while the lower end is twisted and tapering. The shell has a broad base. Its colour is dull, and the surface is hard, brittle and translucent. Like all snail shells, the interior is hollow. The inner surfaces of the shell are very shiny, but the outer surface exhibits high tuberculation. In Hinduism, the śaṅkha that is shiny, white, soft with pointed ends and heavy is sought after.

**Śaṅkha- synonyms:**

शंखस्तु शंखकः कम्बुस्त्रिरेखश्च समुद्रजः । सुनादो दीर्घनादश्च कम्बोजश्च प्रकीर्तितः ॥ (R. T. 12/1)

Śaṅkha, śaṅkhaka, kambu, trirekha, samudraja, sunāda, dīrghanāda and kamboja; all these are the synonymous words with which the drug 'śaṅkha' (conch shell) is identified in the classics.

**Śaṅkha- brief history:**

Śaṅkha has a long history. Its name can be readily traced from the stories of 'Mahābhārata' and 'Śrīmadbhāgavata'. Since 'Saṁhitā period', the 'śukti' is

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used for pharmaceutical as well as therapeutic purposes. Its references are found in 'Caraka Saṁhitā', 'Suśruta Saṁhitā', 'Aṣṭāṅga Saṅgraha' and 'Aṣṭāṅga Hṛdaya'.

Rasārṇava and Rasaratnakāra have included the drug in 'śuklavarga' and dealt in detail about the drug. Its elaboration can be traced from 12th chapter of 'Rasataraṅgiṇī'.

**Śaṅkha- grāhya swarūpa:**

> वृत्तः स्निग्धः सूक्ष्ममुखो निर्मलश्चेन्दुसुन्दरः । दीर्घकायो गुरुश्चापि शङ्खः श्रेष्ठः प्रकीर्तितः ॥
>
> (R. T. 12/2)

The 'śaṅkha', which is round bodied with smooth external surface, which has small opening towards the base, which is clean and bright like full moon, and the one, which is lengthy and heavy is considered as the best sample of 'śaṅkha' (conch shell) used for therapeutic purposes.

**Śaṅkha- types and their description:**

> शङ्खस्तु द्विविधः प्रोक्तो रसतन्त्रविचक्षणैः । प्रथमो दक्षिणावर्तो वामावर्तोऽपरो मतः ॥
>
> (R. T. 12/3-5)

As per 'rasa' texts, 'śaṅkha' is of two types:

1. Dakṣiṇāvarta śaṅkha
2. Vāmāvarta śaṅkha

> दक्षिणावर्तशङ्खस्तु प्रशस्तो देवपूजने । त्रिदोषघ्नो निधिश्चापि स्मृतो दारिद्र्यनाशनः ॥
> वामावर्ताभिधः शङ्खः सर्वत्र सुलभो मतः । अतः स एव वैद्यैस्तु मारणार्थं प्रयुज्यते ॥
>
> (R. T. 12/3-5)

1. Dakṣiṇāvarta śaṅkha: It is rarer variety of 'conch shell'. Since it is not abundantly available, it is considered auspicious and used in temples to blow during prayers. Therapeutically, it can mitigate all the three doṣas. It is believed to alleviate the poverty of the society.
2. Vāmāvarta śaṅkha: This variety of 'conch shell' is abundantly available. It is the one, which is used for purification, incineration and for all the other compound formulations.

**Śaṅkha śodhana- 1st method:**

> शङ्खन्तु खण्डशः कृत्वा पोट्टल्यां स्थापयेद्भिषक् । दोलायन्त्रे चतुर्यामं पचेज्जम्बीरवारिणा ॥
> प्रक्षालयेच्छङ्खखण्डान् प्रतप्तेनाम्भसा ततः । इत्थं नातिचिरादेवं शङ्खं शुद्धिमवाप्नुयात् ॥
>
> (R. T. 12/6-7)

Śaṅkha is made into smaller pieces and those pieces are tied in a cloth like poṭṭalī. It is hung in a 'dolāyantra' containing 'jambīra nimbū rasa' as liquid media and subjected for swedana of four yāma (12 hours). Later, the drug in the cloth is washed with warm water, dried and stored as 'śuddha śaṅkha'.

**Śaṅkha śodhana- 2nd method:**

जयन्त्याः स्वरसेनैव शंखं दोलागतं पचेत् । यामैकं पाचनादेव शुद्धिमायात्यनुत्तमाम् ।।

(R. T. 12/8)

Śaṅkha is made into smaller pieces and those pieces are tied in a cloth like poṭṭalī. It is hung in a 'dolāyantra' containing 'jayantī swarasa' as liquid media and subjected for swedana of one yāma (3 hours). Later, the drug in the cloth is washed with water, dried and stored as 'śuddha śaṅkha'.

**Śaṅkha śodhana- 3rd method:**

ताण्डुलीयद्रवेणेह शंखं दोलागतं पचेत् । यामैकं पाचनादेव शुद्धिमायात्यनुत्तमाम् ।। (R. T. 12/9)

Śaṅkha is made into smaller pieces and those pieces are tied in a cloth like poṭṭalī. It is hung in a 'dolāyantra' containing 'taṇḍulīya swarasa' as liquid media and subjected for swedana of one yāma (3 hours). Later, the drug in the cloth is washed with water, dried and stored as 'śuddha śaṅkha'.

**Śaṅkha śodhana- 4th method:**

काञ्जिकेन पचेच्छंखं दोलायन्त्रे भिषग्वरः । क्षालयेच्चोष्णतोयेन शंखः शुद्धिमवाप्नुयात् ।।

(R. T. 12/10)

Śaṅkha is made into smaller pieces and those pieces are tied in a cloth like poṭṭalī. It is hung in a 'dolāyantra' containing 'kāñjī' as liquid media and subjected for swedana of one yāma (3 hours). Later, the drug in the cloth is washed with warm water, dried and stored as 'śuddha śaṅkha'.

**Śaṅkha śodhana- 5th method:**

निम्बूकाम्लसमायुक्तवारा दोलाख्ययन्त्रके । यामार्द्धं पाचितः शंखः शुद्धिमायात्यनुत्तमाम् ।।

(R. T. 12/11)

Śaṅkha is made into smaller pieces and those pieces are tied in a cloth like poṭṭalī. It is hung in a 'dolāyantra' containing 'jambīra nimbū rasa' diluted with equal quantity of water and subjected for swedana of half yāma (1.5 hours). Later, the drug in the cloth is washed with warm water, dried and stored as 'śuddha śaṅkha'.

**Śaṅkha māraṇa:**

शुद्धशङ्खस्य खण्डानि शरावे स्थापयेत्सुधीः । शरावेण पिधायाथ यत्नात्सन्धिं प्रलेपयेत् ।।
आतपे त्वथ संशोष्य पुटेद् गजपुटे भिषक् । स्वतःशीतं समुद्धृत्य खल्वे सञ्चूर्णयेद्भिषक् ।।

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चूर्णितञ्चाथ विज्ञाय सम्पुटस्थं ततः पुटेत् । एवं पुटद्वयेनैव शङ्खको मृतिमाप्नुयात् ।।
(R. T. 12/17-19)

The pieces of 'śuddha śaṅkha' are enclosed in 'śarāva sampuṭa'. The sampuṭa is sealed and dried under sun. Later it is subjected for one 'gajapuṭa'. When cool on its own, the drug material inside is taken in khalva yantra and triturated to fine powder form.

This powder is again enclosed in 'śarāva sampuṭa', sealed, dried and subjected for another 'gajapuṭa'. When cool on its own, the white fine powder inside the 'śarāva' is collected and stored as 'śaṅkha bhasma'. Like this with 2 gajapuṭa, appropriate 'śaṅkha bhasma' can be prepared.

**Śaṅkha bhasma dosage and adjuvant:**

Two rattī (250 mgs) is the general dosage of 'śaṅkha bhasma'. It is administered along with 'nimbū swarasa' or lukewarm water.

**Śaṅkha bhasma- properties:**

शङ्खः सुशीतलः क्षारस्त्वम्लपित्तविनाशनः । अग्निमान्द्यहरो वल्यो ग्राही ग्रहणिकाहरः ।।
परिणामोत्थशूलघ्नस्तारुण्यपिडिकापहः । विषदोपहरो वर्ण्यो मात्रा गुञ्जद्वयोन्मिता ।।
(R. T. 12/20-21)

Śaṅkha bhasma will have 'śītala' (cold to touch) and 'kṣārīya' (alkaline) properties. Its judicious use cures 'amlapitta' roga. It corrects 'agnimāndya' and provides strength. It is balya, grāhī and cures grahaṇī roga. It is useful in 'pariṇāma śūla' (abdominal pain) and 'tāruṇya piḍaka' (acne vulgaris).

It is useful in all types of 'viṣa doṣa'. Its judicious use provides good skin complexion. Its dosage is two rattī (250 mgs), which has to be finalized after consideration of all the dosage influencing factors.

- Another reference:

शङ्खः क्षारो हिमो ग्राही ग्रहणीरोगनाशनः। नेत्रपुष्पहरो वर्ण्यस्तारुण्यपिटिकाप्रणुत्।। (Āy. Pra. 2/262)

Śaṅkha bhasma possesses 'kṣārīya' (alkaline) and 'śītala' (cold to touch) guṇa. It is grāhī. Its judicious use cures grahaṇī roga and netrapuṣpa roga. It is 'varṇya' and is also useful in 'tāruṇya piḍaka' (acne vulgaris).

**Śaṅkha bhasma- āmayika prayoga:** (R. T. 12/22-29)

1. To cure severe 'atisāra' and 'grahaṇī' roga, 'śaṅkha bhasma' is administered daily in the suitable dosage along with 'nimbū swarasa'.
2. To cure loss of appetite (agnimāndya), 'śaṅkha bhasma' is administered daily in the suitable dosage along with 'trikaṭu cūrṇa'.

3. To cure 'amlapitta roga', 'śaṅkha bhasma' is administered daily in the suitable dosage along with 'āmalakī cūrṇa'.
4. To cure 'gulma roga', 'śaṅkha bhasma' is administered daily in the suitable dosage along with 'trikaṭū cūrṇa' and 'yavakṣāra'.
5. To cure 'sannipātika śūla', 'śaṅkha bhasma' is administered daily in the suitable dosage along with 'trikaṭu cūrṇa', 'saindhava lavaṇa' and 'śuddha hiṅgu'.
6. To cure 'pariṇāma śūla', 'śaṅkha bhasma' is administered daily in the suitable dosage along with 'lavaṇa pañcaka' added with either 'guḍa' or 'trikaṭu cūrṇa'.
7. In case of severe 'śwāsa roga', 'śaṅkha bhasma' is administered daily in the suitable dosage along with 'bhārṅgī cūrṇa'.
8. To improve the appetite, 'śaṅkha bhasma' is administered daily in the suitable dosage along with 'śuṇṭhī cūrṇa'.
9. To cure all types of 'atisāra roga', 'śaṅkha bhasma' is added with fine powders of 'mustā', 'jātīphala', 'ahiphena' and 'ṭaṅkaṇa' in equal ratio and administered daily in the dosage of one rattī (125 mgs).
10. To cure severe 'chardi roga', 'śaṅkha bhasma' is administered daily in the suitable dosage along with the fine powders of 'haridrā' and 'pūga'.
11. Śaṅkha bhasma is added with the 'bhasma' of 'kṣāra' of 'mūlaka', triturated with little quantity of water and applied daily over 'kaphārbuda' or 'kaphaja granthi' to alleviate the same.

**Śaṅkha bhasma- compound formulations:**

1. Śaṅkhadrāva
2. Mahāśaṅkha vaṭī
3. Kaphaketu rasa
4. Grahaṇīkapāṭa rasa
5. Pravālapañcāmṛta rasa
6. Agnikumāra rasa
7. Agnisandīpana rasa
8. Apūrvamālinī vasanta rasa

### 5. ŚAMBŪKA/KṢUDRA ŚAṄKHA

(Pila/Snail shell)

**Śambūka (pila)- general information:**

*Pila* (gastropod), a genus of 'African and Asian apple snails', containing around 30 species, including the threatened *Pila speciosa*. The type species is *Pila ampullacea* .

Older *Pila* snails have a calcified inside of the operculum (shell door). This is characteristic for the snails of the *Pila* genus and hasn't been described by the other genera of the Ampullariidae family.

### Śambūka- synonyms:

क्षुद्रशंख: शंखनक: शम्बूक: स्वल्पशंखक: । क्षुल्लको नखशंखश्च नामान्येतानि शंखके ।।
(R. T. 12/57)

Kṣudra śaṅkha, śaṅkhanaka, śambūka, swalpa śaṅkha, kṣullaka, nakha śaṅkha; all these are the synonymous words used to identify the drug in classics.

### Śambūka- śodhana:

अम्लेन केनचिद्वापि कामं स्थालीगतं पचेत् । यामार्द्धेनैव शम्बूक: शुद्धिमायात्यनुत्तमाम् ।।
(R. T. 12/58)

The kṣudra śaṅkha (śambūka) are boiled in 'nimbū rasa' or any other 'amla dravya' for 1.5 hours (yāmārdha) in a mud pot is placed over mild fire. Later the drug is washed with warm water, dried and stored as 'śuddha śambūka'.

### Śambūka- māraṇa:

शंखवन्मारणं त्वस्य करणीयं भिषग्वरै: । कुमारीस्वरसेनैव सम्पुटस्थं पुटेत्तु वा ।। (R. T. 12/59)

The 'kṣudra śaṅkha māraṇa' is same as that of 'śaṅkha māraṇa', which is mentioned above in this chapter. Alternatively, the pieces of 'kṣudra śaṅkha' are placed in the pulp of 'ghṛtakumārī', enclosed in 'śarāva sampuṭa' and subjected for one gajapuṭa. When cool on its own, the white coloured bhasma is collected from the sampuṭa, triturated and stored as 'śambūka bhasma'.

### Śambūka bhasma- properties:

क्षुद्रशंखस्तु शूलघ्नो नेत्रामयनिषूदन: । रक्तातिसारशमनो दीपन: पाचनस्तथा ।। (R. T. 12/60)

The 'śambūka bhasma' is good in curing all types of 'udara-śūla' (abdominal pains) and all types of eye diseases. It cures 'raktātisāra' and is a good appetizer and digestive.

### Śambūka bhasma- dosage and adjuvant:

Two rattī (250 mgs) is the general dosage of 'śambūka bhasma'. It is administered along with 'nimbū swarasa' or 'uṣṇodaka'.

### Śambūka bhasma- āmayika prayoga: (R. T. 12/61-63)

1. In 'pariṇāma śūla', the 'śambūka bhasma' is administered in suitable dosage along with 'warm water'.
2. In all types of 'udara śūla', the 'śambūka bhasma' is added with the fine powders of 'kṛṣṇa marica' and 'pañca lavaṇa' in equal quantities and administered in suitable dosage before and after food along with water.
3. In 'vātaja grahaṇī roga', the 'śambūka bhasma' is added with equal

quantity of 'saindhava lavaṇa' and administered in suitable dosage along with honey.

## 6. MṚGA-ŚṚṄGA

(Antelers/Hart's horn/Deer horn)

**Mṛgaśṛṅga (antlers)- introduction:**

**Antlers** are the usually large, branching bony appendages on the heads of males of most deer species. *Antler* originally meant the lowest tine, the "brow tine". It comes from the Old French *antoillier*, of uncertain origin, possibly from some form of an unattested Latin word *'anteocularis'*, "before the eye" (and applied to the word for "branch" or "horn").

**Occurrence:**

Antlers are unique to cervids and found mostly on males: only caribou and reindeer have antlers on the females, and these are normally smaller than those of the males. Nevertheless, fertile does from other species of deer have the capacity to produce antlers on occasion, usually due to increased testosterone levels.

**Human usage:**

Shed antlers have been used by craftspeople since ancient times to make tools, weapons, ornaments, and toys. They are worn in traditional dances such as Yaqui deer dances and carried in the Abbots Bromley Horn Dance.

In the velvet stage, antlers of elk and deer have been used in Asia as a dietary supplement or alternative medicinal substance for more than 2,000 years. In prehistoric times a large shed deer antler from a suitable species (e.g. red deer) was often cut down to its shaft and its lowest tine and used as a one-pointed pickax.

**Mṛgaśṛṅga- synonyms:**

मृगशृङ्गं त्वेणशृङ्गं तथा मृगविषाणकम् । हरिणशृङ्गकञ्चैव समाख्यातं भिषग्वरैः ॥

(R. T. 12/103)

Mṛgaśṛṅga, eṇaśṛṅga, mṛgaviṣāṇa and hariṇaśṛṅga; all these are the synonymous words with which this drug is identified in the classics.

**Mṛgaśṛṅga- brief history:**

Mṛgaśṛṅga has a long history. Its first reference is found in 'Suśruta Saṁhitā', where its masi is prepared and used for therapeutic purposes. In all the later books, this drug's medicinal use is seen.

## Mṛgaśṛṅga- grāhya swarūpa:

कीटानुपहतं दीर्घं भाराढ्यं सुदृढं तथा । अनेकशृङ्गसंयुक्तं मृगशृङ्गं वरं मतम् ।। (R. T. 12/104)

The 'mṛgaśṛṅga' (antler) selected for use of therapeutic purposes should be free from any kind of infestation. It should be long, heavy and strong with many branches. Such a deer horn is believed to have all the therapeutic properties intact.

## Mṛgaśṛṅga- śodhana:

The purification of 'mṛgaśṛṅga' is not required as per classical references.

## Mṛgaśṛṅga- māraṇa:

मृगशृङ्गं समादाय करपत्रेण कर्तयेत् । खण्डशः कारयित्वा च त्वङ्गाराग्नौ दहेत्ततः ।।
सुदग्धञ्चाथ विज्ञाया खल्वे सञ्चूर्णयेद्भिषक् । रविदुग्धेन सम्पेष्य चक्रिकाः कारयेत्ततः ।।
शरावसम्पुटान्तःस्थं पुटेत्तीव्राग्निना भिषक् । त्रिवारं पुटनादेणविषाणं मृतिमाप्नुयात् ।।
(R. T. 12/105-107)

The selected 'mṛga-śṛṅga' (deer horn) is properly cleaned and cut into smaller pieces with a 'saw'. Those pieces are put on fire of glowing charcoal and burnt. When properly burnt, the pieces are taken in khalva yantra and triturated to obtain fine powder. This powder is now subjected for thorough trituration with 'arka dugdha' to prepare 'cakrikās' (pellets) of suitable size and thickness.

These pellets are dried under sun, enclosed and sealed in 'śarāva sampuṭa'. This sampuṭa is subjected for one 'gajapuṭa'. When cool on its own, the drug material inside the sampuṭa is triturated again with 'arka dugdha' to prepare pellets. They are dried and subjected for another 'gajapuṭa'. Like this after application of three 'gajapuṭa' we obtain smooth **'black coloured'** bhasma of 'mṛgaśṛṅga'.

If the antler is burnt in open air, triturated with 'kumārī swarasa' and subjected for 4 to 5 gajapuṭa, the bhasma obtained will be of **'white colour'**.

## Mṛgaśṛṅga bhasma- dosage and adjuvant:

One to two rattī (125 mgs to 250 mgs) is the general dosage of 'mṛgaśṛṅga bhasma'. It is administered along with honey, ghee, moil or butter.

## Mṛgaśṛṅga bhasma- properties & āmayika prayoga:

(R. T. 12/108-109)

मृगशृङ्गसमुद्भूता विभूतिर्गव्यसर्पिषा । विनाश्येत् घ्राणादेव हृच्छूलमतिदारुणम् ।।
हरिणविषाणसमुत्था भूतिः क्षौद्रेण रक्तिमिता । अपहरतीह निकामं हृच्छूलं पार्श्वशूलञ्च ।।

1. Mṛgaśṛṅga bhasma is a good kapha-nissāraka (alleviates vitiated kapha doṣa).
2. To cure severe 'hṛdaya śūla', the 'śṛṅga bhasma' is administered daily in suitable dosage along with 'cow's milk' or 'butter'.
3. To cure 'hṛdaya śūla' and 'pārśwa śūla', the 'śṛṅga bhasma' is administered daily in the dosage or one rattī (125 mgs) along with 'honey'.
4. To cure 'hikkā' and 'śwāsa' roga, the 'śṛṅga bhasma' is added with equal quantities of 'badara majjā', 'apāmārga bīja cūrṇa' and 'pippalī cūrṇa' and administered daily in suitable dosage along with 'honey'.
5. The 'śṛṅga bhasma' is added with equal quantities of 'bhāṛṅgī cūrṇa', 'marīca cūrṇa', 'drākṣā kalka', 'pippalī cūrṇa' and 'kharjūra kalka'; the mixture is administered daily in suitable dosage to cure 'śwāsa roga'.

**Mṛgaśṛṅga bhasma- compound formulations:**

1. Trinetra rasa
2. Grahaṇīvajrakapāṭa rasa
3. Jwarāṅkuśa rasa
4. Sarveśwara rasa
5. Javāharmoharā vaṭī

## 7. KHAṬIKĀ

(Chalk or Pipe clay)

**Khaṭikā (chalk)- general information:**

**Chalk** is a soft, white, porous sedimentary rock, a form of limestone composed of the mineral calcite. Calcite is calcium carbonate or $CaCO_3$. It forms under reasonably deep marine conditions from the gradual accumulation of minute calcite plates (coccoliths) shed from micro-organisms called coccolithophores. It is common to find chert or flint nodules embedded in chalk. Chalk can also refer to other compounds including magnesium silicate and calcium sulfate.

Chalk has greater resistance to weathering and slumping than the clays with which it is usually associated, thus forming tall steep cliffs where chalk ridges meet the sea. Chalk hills, known as chalk downland, usually form where bands of chalk reach the surface at an angle, so forming a scarpslope. Because chalk is porous it can hold a large volume of ground water, providing a natural reservoir that releases water slowly through dry seasons.

**Khaṭikā- synonyms:**

खटिका खटिनी चैव खटी लेखनमृत्तिका । कठिनी वै कठिनिका वर्णिका वर्णलेखिका ।।

(R. T. 11/208)

Khaṭikā, khaṭinī, khaṭī, lekhana-mṛttikā, kaṭhinī, kaṭhinikā, varṇikā and varṇa-lekhikā; are the synonymous terms used for the drug chalk/pipe clay in the classics.

### Khaṭikā- brief history:

The first reference of this drug is found in 'Rasaratnasamuccaya', a book of 13th century. Later on all the rasa, books have dealt with this drug. Detailed explanation of 'khaṭikā' may be traced from 11th chapter of 'Rasataraṅgiṇī'.

### Khaṭikā- two types:

खटिका द्विविधा ख्याता खटी गौरखटी तथा । खटी तु मलिना चान्या श्वेता मृदुशिलोपमा ॥
(R. T. 11/209)

1. Khaṭī (common pipe clay)
2. Goura khaṭī (white pipe clay)

Out of these two, the first variety will be muddy and unclean in appearance, whereas the second variety is a clean, soft and white in colour. Another reference with same categorization is as below;

खटी गौरखटी चेति द्विधाऽद्या मलिना स्मृता । मृदुपाषाणसदृशा खटी शुभ्राऽधिका गुरुः ॥
(Āy. Pra. 2/264-265)

### Khaṭikā- śodhana:

खटीचूर्णं शुद्धपात्रे निधाय विमले जले । प्रक्षालयेद्विधानज्ञो विशुध्यति न संशयः ॥(R. T. 11/210)

The powder of 'khaṭikā' is taken in a clean stainless steel vessel. It is added with enough quantity of clean water, macerated and filtered. The wet powder obtained is spread on a steel plate and dried under sun. The dried powder is triturated and stored in suitable airtight container as 'śuddha khaṭikā'.

### Khaṭikā- māraṇa:

Not required and has no classical references.

### Khaṭikā- properties:

खटिका शिशिरा तिक्ता मधुरा शोथनाशिनी । पित्तप्रशमनी कामं विविधव्रणरोपणी ॥
कफदाहास्रदोषघ्नी नेत्रामयनिषूदिनी । हरिद्वर्णातिसारघ्नी स्वेदादिस्रावहारिणी ॥
(R. T. 11/211-212)

Khaṭikā will have śīta guṇa and tikta-madhura rasa. It alleviates 'śotha' (inflammation). It does pitta doṣa śamana. It cures many types of wounds. It mitigates vitiated kapha doṣa, dāha and rakta doṣa. It is helpful in all types of eye diseases. It cures atisāra roga with greenish stool excretion. It prevents excessive perspiration.

### Khaṭikā- dosage and adjuvant:

Half to one māṣa is the general dosage of 'śuddha khaṭikā'. It is administered along with water.

### Khaṭikā- āmayika prayoga:

माषोन्मितं खटीचूर्णं भक्षितं शीतवारिणा । प्रवाहिकाञ्च पित्तास्र ग्रहणीश्च विनाशयेत् ।।
खटी शुद्धा मधुरिकातोयेन सितयान्विता । शीलिता विनिहन्त्याशु त्वतीसारं सुदारुणम् ।।

(R. T. 11/213-214)

One māṣa (1 gm) of 'śuddha khaṭikā cūrṇa' is administered daily with cold water to cure 'pravāhikā', 'raktapitta' and 'grahaṇī' roga. Khaṭikā cūrṇa if added with sugar and administered along with 'śatapuṣpārka', it cures severe 'atisāra' roga.

### Khaṭikā- compound formulations:

1. Daśanasaṁskāra cūrṇa
2. Mugdha rasa
3. Khaṭikādi peya

## 8. GODANTĪ

(Gypsum)

### Godanti (gypsum)- introduction:

**Gypsum** is a very soft sulphate mineral composed of **'calcium sulphate dihydrate'**, with the chemical formula $CaSO_4$-$2H_2O$. It possesses hardness of 2 and specific gravity of 2.4. It is found in alabaster, a decorative stone used in Ancient Egypt. It is the second softest mineral on the Mohs scale of mineral hardness. It forms as an evaporite mineral and as a hydration product of anhydrite.

### Etymology and history:

The word gypsum is derived from the Greek word '*gypsos*', "chalk" or "plaster". Because the gypsum from the quarries of the Montmartre district of Paris have long furnished burnt gypsum used for various purposes, this material has been called plaster of Paris.

Gypsum was known in Old English as "spear stone", referring to its crystalline projections. (Thus, the word **spar** in mineralogy is by way of comparison to gypsum, referring to any non-ore mineral or crystal that forms in spear like projections.) In the early 19th century, it was regarded as an almost miraculous fertilizer American farmers were so anxious to acquire it, a lively smuggling trade with Nova Scotia evolved, resulting in the so-called "Plaster War".

**Physical properties:**

Gypsum is moderately water-soluble and in contrast to most other salts, it exhibits a retrograde solubility, becoming less soluble at higher temperatures. When the crystal lattice is heated, it loses liquid water molecules to evaporation and thus gains solidity. As for anhydrite, its solubility in saline solutions and in brines is also strongly dependent on NaCl concentration. Gypsum crystals are found to contain anion water and hydrogen bonding.

**Godantī- synonyms:**

गोदन्तिका च गोदन्ता गोदन्तं कथ्यते बुधैः । तत्तु पाषाणजातीयं सौम्यं तालसमं न तत् ।।
(R. T. 11/237)

Godantikā, godantā and godanta; are the synonyms of 'godantī'. It is a mineral drug with 'soumya' (śīta) guṇa but does not keep any similarity with 'haratāla' (Arsenic trisulphide; $As_2S_3$).

**Godantī- brief history:**

This drug has no reference in any of the classical books up to 20th century. During earlier 20th century, the drug was inducted into the books of Āyurveda and in later books; the drug is dealt under 'sudhā varga'.

**Godantī- grāhya swarūpa:**

पत्राचितं सुमसृणं शरदिन्दुसुनिर्मलम् । दीप्तप्रभं तु गोदन्तं ग्राह्यमत्र प्रकीर्तितम् ।। (R. T. 11/238)

Godantī is a mineral drug with many adjacent shiny layers. The drug will have white and lustrous radiance like the moon of 'śarad ṛtu'. Such sample of this drug is considered therapeutically fit (grāhya).

**Godantī śodhana:**

गोदन्तं निम्बुनीरेण द्रोणपुष्पीरसेन वा । यामार्द्धेनैव सुस्विन्नं विशुद्ध्यति न संशयः ।। (R. T. 11/239)

Godantī is tied in a cloth like poṭṭalī and hung in 'dolāyantra' having 'nimbū swarasa' or 'droṇapuṣpī rasa' as liquid media. The pot is placed over mild fire and the process of swedana is carried out for 1.5 hours (yāmārdha). Later the drug inside the poṭṭalī is washed with warm water, dried completely and stored in airtight container as 'śuddha godantī'.

**Godantī- māraṇa:**

शरावसंपुटान्तःस्थं गोदन्तं सुविशोधितम् । म्रियते पुटितं भस्म जायते शशिसुन्दरम् ।।
(R. T. 11/240)

The roughly pounded 'godantī' is enclosed in 'śarāva sampuṭa' and subjected for one 'laghu puṭa' with dry cow dung cakes. When cool on its own, the white bhasma inside the śarāva is collected, triturated and stored as 'godantī bhasma'.

**Godantī bhasma- dosage:**

गुञ्जैकतः समारभ्य गुञ्जात्रयमितं परम् । गोदन्तं विनियुञ्जीत बलकालाद्यपेक्षया ।। (R. T. 11/242)

One to three rattī (125 mgs to 375 mgs) is the dosage of 'godantī bhasma'. The dosage is finalized after thorough consideration of roga bala, rogī bala and all the other influencing factors.

Adjuvant: It is administered along with honey, sugar, ghee or milk.

**Godantī bhasma- properties:**

गोदन्तं सुमृतं शीतं पित्तज्वरनिषूदनम् । जीर्णज्वरहरं बल्यं दीपनं श्वासकासनुत् ।। (R. T. 11/241)

Since 'godantī bhasma' has śīta guṇa, it is beneficial in 'pittaja jwara'. With different adjuvant, it cures 'jīrṇa jwara', 'śwāsa' and 'kāsa' roga. Its regular use provides physical strength and improves the appetite.

**Godantī bhasma- compound formulations:**

1. Muktādi vaṭī
2. Trailokyacintāmaṇi rasa
3. Bālapañcabhadra rasa
4. Śaṅkhadrāvaka rasa
5. Kālāgnibhairava rasa

## 9. SAMUDRAPHENA

(Cittle Fish Bone)

**Samudraphena (cuttle fish bone)- introduction:**

**Cuttlebone**, also known as **cuttlefish bone** or **quill** is a hard, brittle internal structure found in all members of the family Sepiidae, commonly known as cuttlefish.

Cuttlebone is composed primarily of aragonite. It is a chambered, gas-filled shell used for buoyancy control; its siphuncle is highly modified and is on the ventral side of the shell. The microscopic structure of cuttlebone consists of narrow layers connected by numerous upright pillars.

Depending on the species, cuttlebones implode at a depth of 200 to 600 meters (660 to 2,000 ft). Because of this limitation, most species of cuttlefish live on the seafloor in shallow water, usually on the continental shelf.

In the past, cuttlebones were used in making polishing powder. The powder was added to toothpaste, and used as an antacid or as an absorbent. Today, cuttlebones are commonly used as calcium-rich dietary supplements for caged birds, chinchillas, hermit crabs, and reptiles.

dr keshav raj

dr keshav raj

**Samudraphena- synonyms:**

> समुद्रफेनः फेनश्च सुफेनः फेनकस्तथा । अब्धिफेनश्च फेनश्च डिण्डीरोऽब्धिकफो मतः ॥
>
> (R. T. 12/110)

Samudraphena, phena, saphena, phenaka, abdhiphena, ḍiṇḍīra and abdhikapha; all these are the synonymous words with which this drug is identified in the classics.

**Samudraphena- śodhana:**

> पृष्ठास्थीन्यब्धिफेनस्य विलिख्यापनयेत्ततः । खल्वे संपेष्य कृत्स्नेन श्लक्ष्णचूर्णञ्च कारयेत् ॥
> निम्बूकस्वरसेनाथ भावयेदेकवारकम् । एवमब्धिकफः शीघ्रं शुद्धिमायात्यनुत्तमाम् ॥
>
> (R. T. 12/111-112)

The 'samudraphena' is cleaned properly from outside by scraping the adhered saline and alkaline sea sediments. Later it is pounded and triturated in khalva yantra to obtain fine powder.

This powder is subjected for thorough trituration for a day with 'nimbū swarasa' and dried at the end. The fine powder obtained is stored in suitable airtight container as 'śuddha samudraphena'.

**Samudraphena- dosage and adjuvant:**

Two rattī (500 mgs) is the general dosage of 'śuddha samudraphena'. It is administered along with honey or water.

**Samudraphena- properties:**

> समुद्रफेनः शिशिरो लेखनः पाचनः सरः । चक्षुष्यो दीपनश्चैव श्रुतिस्रावहरः परम् ॥
> विषदोषप्रशमनः कषायः कफनाशनः । कुष्ठरोगहरोऽत्यर्थं मात्रा रक्तिद्वयोन्मिता ॥
>
> (R. T. 12/113-114)

The 'śuddha samudraphena' will have 'śīta vīrya'. It possesses lekhana and pācana guṇa. It enhances the intestinal motility (sara guṇa). It is useful in all types of netraroga as it is 'cakṣuṣya'. It is a good appetizer. It dries up the infectious secretions from ears and is good against 'viṣa doṣa'. It has 'kaṣāya' rasa, mitigates kapha doṣa and is useful in all types of 'kuṣṭha roga'.

**Samudrapena- āmayika prayoga:** (R. T. 12/115-123)

1. The fine powder of 'śuddha samudraphena' is triturated with equal quantity of 'sugar' and the fine powder is applied daily as 'añjana' in the eyes to cure 'netra-śukla' (corneal opacity).
2. The fine powder of 'śuddha samudraphena' is triturated with equal quantity of 'śaṅkha cūrṇa' and 'saindhava lavaṇa' the fine powder obtained is daily applied as 'añjana' in the eyes with a 'tāmra śalākā' to

cure 'netra-śukla' (corneal opacity) and such other surgical ailments of eye. This medicine works as 'anuśastra' and cures the ailments.

3. The fine powder of 'śuddha samudraphena' is triturated with equal quantity of 'pippalī cūrṇa' and 'saindhava lavaṇa' the fine powder is added with honey and applied daily as 'añjana' in the eyes to cure 'netra-puṣpa' (avraṇa śukla).
4. One part of 'śuddha samudraphena' is added with 'śuddha tuttha' (1/6th part) and 'harītakī cūrṇa' (1/6th part). The mixture is triturated with water to prepare wicks of desired size. They are dried and stored in suitable airtight container. One wick is rubbed on a clean surface with a drop of water and the solution obtained is applied daily as 'añjana' to cure 'pothakī' roga.
5. One part of 'śuddha samudraphena' is added with equal quantities of 'sarjarasa', 'saindhava lavaṇa' and 'rasāñjana'. The mixture is triturated with water to prepare wicks of desired size. They are dried and stored in suitable airtight container. One wick is rubbed on a clean surface with a drop of water and the solution obtained is applied daily as 'añjana' to cure 'klinnavartma' roga and to encourage the growth of eyelashes.
6. The fine powder of 'śuddha samudraphena' is filled in a 'karṇa nāḍī' (a small pipe). One end of the pipe is placed in the infected ear and forcefully puffed from the other end to deposit the medicine inside the ear. This cures the chronic ear infections with profuse ear secretions.
7. The fine powder of 'śuddha samudraphena' is added with equal quantity of 'samagandhaka kajjali' or 'śuddha hiṅgula'. The mixture administered daily in suitable dosage to cure 'kaphapittaja jwara'.
8. The fine powder of 'śuddha samudraphena' is added with equal quantity of 'mṛddāra śṛṅga'. The mixture is added with required quantity of 'honey' and applied over the wounds to heal the same.
9. To do 'śukra śuddhi', the fine powder of 'śuddha samudraphena' is added with equal quantities of 'kokilākṣa', 'kāleyaka', 'kaṭphala' and 'uśīra'. The mixture is administered daily in suitable dosage along with 'juice of sugarcane' or the fine powder of the sugarcane plant roots.

## 10. KUKKUṬĀṆḌA TWAK

(Hen's Egg Shell)

**Kukkuṭāṇḍa twak- Introduction:**

Kukkuṭāṇḍa twak is the shell of hen's egg. Since it is rich in calcium, it has been included under 'sudhā varga'. After the eggs are used in kitchen and bakeries, the shell are usually thrown away. These shells can be used as a source of calcium. This drug has no classical references.

**Kukkuṭāṇḍa twak- śodhana:**

The shells of hen's egg are soaked in any of the sour or salty liquids (kāñjī or saline water) for 3 to 4 hours. Later the sticky sheath at the inner side of the shell is removed and dried under sun. These dry shells are later stored as 'śuddha kukkuṭāṇḍa twak' for further pharmaceutical use.

**Kukkuṭāṇḍa twak- māraṇa:**

The dry 'śuddha kukkuṭāṇḍa twak' is taken in a clean khalva yantra. It is added with 'cāṅgerī swarasa' or 'ghṛtakumārī swarasa' and triturated thoroughly to prepare 'cakrikās' of even size and shape.

The cakrikās are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one laghu puṭa (using 8 to 10 dry cow dung cakes). When self-cool the white coloured smooth and soft 'kukkuṭāṇḍa twak bhasma' is collected and stored in suitable container.

**Kukkuṭāṇḍa twak bhasma- dosage and adjuvant:**

Two to four rattī (250 mgs to 500 mgs) is the general dosage of 'kukkuṭāṇḍa twak bhasma'. It is administered along with honey, butter, sugar, cream or any other suitable adjuvant.

**Kukkuṭāṇḍa twak bhasma- properties:**

Its use strengthens the bones. It is used in growing children, lactating mother and old aged persons who require additional calcium. It is 'hṛdya' (cardiotonic) and is good for digestive system. It mitigates vitiated kapha and vāta doṣa. Its regular use improves the body mass, it is aphrodisiac and strengthens the central nervous system. In women, it is indicated for raktapradara, śwetapradara and somaroga.

### 11. KŪRMAPṚṢṬHA/KŪRMĀSTHI

(Tortoise Bone)

**Kūrmapṛṣṭāsthi- introduction:**

Kūrmapṛṣṭāsthi is the bone of tortoise. Since it is rich in calcium, it has been included under 'sudhā varga'. After the death of tortoise, these bones can be used as a source of calcium. This drug has no classical references.

**Kūrmapṛṣṭāsthi- śodhana:**

The shells of hen's egg are soaked in any of the sour liquids (kāñjī) for 12 hours. Later it is washed, dried and stored as 'śuddha kūrmapṛṣṭāsthi' for further pharmaceutical use.

**Kūrmapṛṣṭāsthi- māraṇa:**

The dry 'śuddha kūrmapṛṣṭāsthi' is made into small pieces. These pieces are placed inside the pulp of 'ghṛtakumārī', enclosed in 'śarāva sampuṭa' and subjected for one gajapuṭa. When self-cool the 'white coloured' smooth and soft 'kūrmapṛṣṭāsthi bhasma' is collected and stored in suitable container.

**Kūrmapṛṣṭāsthi bhasma- dosage and adjuvant:**

Two to four rattī (250 mgs to 500 mgs) is the general dosage of 'kūrmapṛṣṭāsthi bhasma'. It is administered along with honey, butter, sugar, cream or any other suitable adjuvant.

**Kūrmapṛṣṭāsthi bhasma- properties:**

Its use strengthens the bones. It is used in growing children, lactating mother and old aged persons who require additional calcium. It is indicated in 'kṣaya roga' and 'apasmāra roga'.

### 12. AJĀSTHI

(Goat's Bone)

**Ajāsthi- introduction:**

Ajāsthi is the bone of goat. Since it is rich in calcium, it has been included under 'sudhā varga'. After the death of goats, its bones can be used as a source of calcium. This drug has no classical references.

**Ajāsthi- śodhana:**

The bones of goat are soaked in any of the sour liquids (kāñjī) for 12 hours. Later it is washed, dried and stored as 'śuddha ajāsthi' for further pharmaceutical use.

**Ajāsthi- māraṇa:**

The dry 'śuddha ajāsthi' is made into small pieces. These pieces are placed inside the pulp of 'ghṛtakumārī', enclosed in 'śarāva sampuṭa' and subjected for one gaja puṭa. When self-cool the 'white coloured' smooth and soft 'ajāsthi bhasma' is collected and stored in suitable container.

**Ajāsthi bhasma- dosage and adjuvant:**

Two to four rattī (250 mgs to 500 mgs) is the general dosage of 'ajāsthi bhasma'. It is administered along with honey, butter, sugar, cream or any other suitable adjuvant.

### Ajāsthi bhasma- properties:

Its use strengthens the bones. It is used in growing children, lactating mother and old aged persons who require additional calcium. It is indicated in 'kṣaya roga'.

## 13. ŚWETĀÑJANA

(Calcite)

### Śwetāñjana (calcite)- introduction:

Śwetāñjana is called 'calcite' in English. It is called as 'safed surmā' in Hindi. Chemically it is identified as Calcium Carbonate ($CaCO_3$). Since it is rich in calcium, it has been included under 'sudhā varga'. This drug has no classical references.

**Calcite** is a carbonate mineral and the most stable polymorph of '**calcium carbonate**' ($CaCO_3$). The other polymorphs are the minerals aragonite and vaterite. Aragonite will change to calcite at 380-470$^0$ C, and vaterite is even less stable.

### Properties:

Calcite crystals are trigonal-rhombohedral, though actual calcite rhombohedra are rare as natural crystals. However, they show a remarkable variety of habits including acute to obtuse rhombohedra, tabular forms, prisms, or various scalenohedra. Calcite exhibits several twinning types adding to the variety of observed forms. It may occur as fibrous, granular, lamellar, or compact. Cleavage is usually in three directions parallel to the rhombohedron form. Its fracture is conchoidal, but difficult to obtain.

It has a defining Mohs **hardness** of 3, a **specific gravity** of 2.71, and its luster is vitreous in crystallized varieties. Color is white or none, though shades of gray, red, orange, yellow, green, blue, violet, brown, or even black can occur when the mineral is charged with impurities.

### Śwetāñjana- śodhana:

Not required and has no classical references.

### Śwetāñjana- māraṇa:

The dry 'śwetāñjana' is powdered in a clean khalva yantra. It is added with required quantity of 'ghṛtakumārī swarasa' and triturated thoroughly to prepare 'cakrikās' of even size and shape.

The cakrikās are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one gaja puṭa. When self-cool the white coloured smooth and soft 'śwetāñjana bhasma' is collected and stored in suitable container.

**Śwetāñjana bhasma- dosage, adjuvant:**

One to three rattī (125 mgs to 375 mgs) is the dosage of 'śwetāñjana bhasma'. The dosage is finalized after thorough consideration of roga bala, rogī bala and all the other influencing factors.

Adjuvant: It is administered along with honey, sugar, ghee or milk.

**Śwetāñjana bhasma- properties:**

Since 'śwetāñjana bhasma' has śīta guṇa, it is beneficial in 'pittaja jwara'. With different adjuvant, it cures 'jīrṇa jwara', 'śwāsa' and 'kāsa' roga. Its regular use provides physical strength and improves the appetite.

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## Chapter 22

# SIKATĀ VARGA

## (Silicate Minerals)

### Sikatā varga (silica)- introduction:

The term sikatā means 'sand' or 'gravel'. The drugs that appear like sand or like small gravels, they are categorized under 'sikatā varga'. Sikatā varga is correlated with silicate minerals.

Silicate minerals are the silica group of drugs that are chemically 'silicon di-oxides' ($SiO_2$). Silica is the chief constituent of sand and hence of glass, which is made of such special sand. It is also called as 'silicic anhydride'.

The drugs included in this category are;

1. Badarāśma : Silicate of lime
2. Kouśeyāśma : Silicate mineral (Asbestos)
3. Nāgapāṣāṇa : Magnesium Silicate
4. Dugdhapāṣāṇa : Hydrated magnesium silicate (Talc)

## 1. BADARĀŚMA

## (Silicate of Lime)

### Badarāśma (silicate of lime)- introduction:

Since the stones of 'badarāśma' resemble the fruits of badara (jujube fruit), they are called so. The stones are greyish in colour with lines on its body. They possess tapering ends on either side. They are tasteless and odourless. They have greenish white colour from inside and are composed of lime and grit.

### Occurrence:

It is found in abundance in majority of Arabian countries. It is imported to India from those countries.

### Badarāśma- vernacular names:

Sanskrit : Badarīpāṣāṇa and Aśmabhid;
English : Fossile Norinite or Fossile Encrinite
Hindi : Berpatthar
Unani name : Hajrulyahūd or Yahud
Chemical name : Silicate of lime

### Badarāśma- brief history:

This drug has no reference in any of the classical books up to 20th century.

From 1950 onwards, the drug was inducted into the books of Āyurveda from 'Unani system of medication'. Acharya Yadavji Trikamji was the first to mention this drug in his book 'Rasāmṛta'. Books later to that have dealt with this drug under 'sudhā varga'.

**Badarāśma- śodhana:**

Badarāśma pieces are heated to red hot and dipped in 'mūlikā swarasa'. this process is repeated for 7 times to obtain the drug purified.

**Badarāśma- māraṇa:**

Śuddha badarāśma is taken in a clean khalva yantra and triturated to obtain fine powder. This powder is triturated with required quantity of 'mūlikā swarasa' to prepare 'cakrikās' of even size and shape.

These cakrikās are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one gajapuṭa. All this process is repeated seven times to subject the drug for seven gajapuṭa. After 7th gajapuṭa, the appropriately prepared 'badarāśma bhasma' is obtained.

**Badarāśma- piṣṭī:**

The fine powder of 'śuddha badarāśma' is taken in a clean khalva yantra, added with required quantity of 'rose water' (gulāba jala) and triturated thoroughly for 3 days to obtain appropriate 'badarāśma piṣṭi'.

**Badarāśma- dosage and adjuvant:**

Four to eight rattī (500 to 1000 mgs) is the general dose of 'badarāśma bhasma and piṣṭī'. It is administered along with honey, mūlaka swarasa, kadalī kanda swarasa, water, milk etc.

**Badarāśma- properties:**

Badarāśma bhasma and piṣṭī are good 'mūtrala' and 'pitta-śāmaka'. They are indicated in mūtra-kṛcchra, mūtrāśmarī, mūtrāghāta, mūtrapradara and upadaṁśa roga.

## 2. KOUŚEYĀŚMA

(Asbestos)

**Kouśeyāśma (asbestos)- introduction:**

The word 'kouśeyāśma' is the Indian or Sanskrit form of the 'Persian' term 'saṅge-reśam'. This drug has no classical reference. It was inducted into the books of Āyurveda in early 20th century. From then on it is counted under 'sikatā varga'.

dr.keshav_raj

Sanskrit name : Kouśeyāśma
English name : Asbestos
Chemical name : Silicate mineral

**Asbestos- general information:**

**Asbestos** is a set of six naturally occurring 'silicate minerals' used commercially for their desirable physical properties. They all have in common their eponymous, asbestiform habit---long (ca. 1:20 aspect ratio), thin fibrous crystals. The prolonged inhalation of asbestos fibers can cause serious illnesses, including malignant lung cancer, mesothelioma (a formerly rare cancer strongly associated with exposure to amphibole asbestos), and asbestosis (a type of pneumoconiosis). The European Union has banned all use of asbestos and extraction, manufacture and processing of asbestos products.

Asbestos became increasingly popular among manufacturers and builders in the late 19th century because of its sound absorption, average tensile strength, its resistance to fire, heat, electrical and chemical damage, and affordability. It was used in such applications as electrical insulation for hotplate wiring and in building insulation. When asbestos is used for its resistance to fire or heat, the fibers are often mixed with cement (resulting in fiber cement) or woven into fabric or mats.

**Occurrence:**

Asbestos mining began more than 4,000 years ago, but didn't start large-scale until the end of the 19th century. The world's asbestos mining peaked around 1975, when asbestos was being mined in some 25 countries, but is today less than half of what it was in the mid-1970s.

**Kouśeyāśma- bhasma:**

Kouśeyāśma is powdered in a clean khalva yantra. It is added with required quantity of 'ghṛtakumārī swarasa' and triturated thoroughly to prepare 'cakrikās' of even size and shape.

The cakrikās are dried under sun, enclosed in 'śarāva sampuṭa' and subjected for one gajapuṭa. All this process is repeated five to seven times to subject the drug to those many number of gajapuṭa. Finally, white coloured smooth and soft 'kouśeyāśma bhasma' is obtained.

**Kouśeyāśma- piṣṭī:**

The fine powder of 'kouśeyāśma' is taken in a clean khalva yantra, added with required quantity of 'rose water' (gulāba jala) and triturated thoroughly for 3 days to obtain appropriate 'kouśeyāśma piṣṭi'.

**Kouśeyāśma- dosage and adjuvant:**

Four to eight rattī (500 to 1000 mgs) is the general dose of 'kouśeyāśma bhasma and piṣṭī'. It is administered along with honey, mūlaka swarasa, kadalī kanda swarasa, water, milk etc.

**Kouśeyāśma- properties:**

Kouśeyāśma bhasma and piṣṭī possess śīta vīrya. They mitigate vitiated pitta doṣa. They are indicated in raktapitta, pradara, prameha, dantapūya and for rakta-sathambhana purposes.

### 3. NĀGAPĀṢĀṆA

(Jaharamoharā; Serpentinite/Ophite)

**Introduction:**

Sanskrit name : Nāgapāṣāṇa
English name : Serpentinite/Ophite
Hindi name : Jaharamoharā
Chemical name : Magnesium Silicate
Chemical formula : $H_4Mg_3Si_2O_2$
Specific gravity : 2.5 to 2.8
Hardness : 2.5 to 4

**Serpentinite** is a rock composed of one or more 'serpentine' group minerals. Minerals in this group are formed by **serpentinization**, a hydration and metamorphic transformation of ultramafic rock from the Earth's mantle. The alteration is particularly important at the sea floor at tectonic plate boundaries.

**Nāgapāṣāṇa śodhana and māraṇa:**

Not done.

**Jaharamoharā piṣṭi:**

The fine powder of 'jaharamoharā' is taken in a clean khalva yantra, added with required quantity of 'rose water' (gulāba jala) and triturated thoroughly for 3 days to obtain appropriate 'jaharamoharā piṣṭi'.

**Jaharamoharā- dosage and adjuvant:**

Two to eight rattī (250 to 1000 mgs) is the general dose of 'jaharamoharā piṣṭī'. It is administered along with honey, milk, ketakī rasa etc.

**Jaharamoharā- properties:**

Jaharamoharā piṣṭī possess rūkṣa guṇa and uṣṇa vīrya. Its regular use strengthens the heart and central nervous system. It promotes the liver function, improves the physical strength and oja. It is indicated in atisāra in children, cardiac diseases and chardi roga.

## 4. DUGDHAPĀṢĀṆA

(Talc)

**Dugdhapāṣāṇa (talk)- general information:**

**Talc** (derived from the Persian *talk* , Arabic *talk*) is a mineral composed of hydrated magnesium silicate with the chemical formula $H_2Mg_3(SiO_3)_4$ or $Mg_3Si_4O_{10}(OH)_2$.

**Physical properties:**

In loose form, it is the widely used substance known as talcum powder. It occurs as foliated to fibrous masses, its crystals being so rare as to be almost unknown. It has a perfect basal cleavage, and the folia are non-elastic, although slightly flexible. It is the softest known mineral and listed as *1* on the Mohs hardness scale. It can be easily scratched by a fingernail. It is also sectile (can be cut with a knife). It has a specific gravity of 2.5 to 2.8, a clear or dusty lustre, and is translucent to opaque. Talc is not soluble in water, but it is slightly soluble in dilute mineral acids. Its colour ranges from white to grey or green and it has a distinctly greasy feel. Its streak is white.

**Uses:**

Talc is used in many industries such as papermaking, plastic, paint and coatings, rubber, food, electric cable, pharmaceuticals, cosmetics, ceramics, etc. Talc is used in baby powder, an astringent powder used for preventing rashes on the area covered by a diaper.

Talc is also used as food additive or in pharmaceutical products as a glidant. In medicine talc is used as a pleurodesis agent to prevent recurrent pleural effusion or pneumothorax.

**Safety:**

Talc powder is a household item, sold globally for use in personal hygiene and cosmetics and used by many millions every year. Some suspicions have been raised about the possibility its use promotes certain types of diseases, mainly cancers of the ovaries and lungs. This is not widely recognized as an established link.

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## Chapter 23
## KṢĀRAVARGA

Under 'kṣāravarga', following drugs are counted;

1. Sarja-kṣāra : Sodium bicarbonate; $NaHCO_3$
2. Yava-kṣāra : Potassium carbonate: $K_2CO_3$
3. Taṅkaṇa-kṣāra : Bŏrax
4. Sūrya-kṣāra : Potassium nitrate (soraka)

### 1. SARJAKṢĀRA

(Sodium bicarbonate; $NaHCO_3$)

**Sarjakṣāra (Sodium bicarbonate):**

**Sodium bicarbonate** or **sodium hydrogen carbonate** is the chemical compound with the formula $NaHCO_3$. Sodium bicarbonate is a white solid that is crystalline but often appears as a fine powder. It has a slightly salty, alkaline taste resembling that of washing soda (sodium carbonate). The natural mineral form is nahcolite. It is a component of the mineral natron and is found dissolved in many mineral springs.

Since it has long been known and is widely used, the salt has many related names such as **baking soda**, **bread soda**, **cooking soda**, and **bicarbonate of soda**. In colloquial usage, its name is shortened to **sodium bicarb**, **bicarb soda**, or simply **bicarb**. The word *saleratus*, from Latin '*sal aeratus*' meaning *aerated salt*, was widely used in the 19th century for both sodium bicarbonate and potassium bicarbonate. The term has now fallen out of common usage.

**Sarjakṣāra- synonyms:**

स्वर्ज्जिकः स्वर्जिका स्वर्ज्जिः स्वर्जः स्वर्ज्जी सुवर्चिका ।
स्वर्ज्जका स्वर्जिकाक्षारः सर्ज्जिः सर्जी च सर्जिका ॥
सुवर्चकः सुवर्चिश्च सुवर्चोऽथ सुवर्चिकः । सुखोर्जिकः कपोतश्च सुखवर्चः सुखार्जिकः ॥
रुचकं स्वर्जिकाक्षारः स्वर्जिक्षारस्तथैव च । सौवर्चलं सुवर्ची च समाख्यातो भिषग्वरैः ॥

(R. T. 13/42-44)

Swarjika, swarjikā, swarji, swarja, swarjī, suvarcikā, swarjikā, swarjikakṣāra, sarji, sarjī, sarjikā, suvarcaka, suvarci, suvarca, suvarcika, sukhorjika, kapota, sukhavarca, sukhārjika, rucaka, swarjikākṣāra, swarjikṣāra, souvarcala and suvarcī; all these are the synonymous words used in the classics to identify the drug.

### Sarjakṣāra- brief history:

Sarjakṣāra has a long history. Its references can be traced from the 'Saṁhitā period'. At many places of 'Caraka Saṁhitā' and 'Suśruta Saṁhitā', this drug is used as an ingredient in compound formulations.

Sarjakṣāra is counted in 'kṣāradwaya', 'kṣāratraya', 'kṣārapañcaka' and 'kṣārāṣṭaka'. This drug is required in many pharmaceutical procedures of mercury; therefore, it has a significant place in the books of 'Rasaśāstra'.

### Sarjakṣāra- method of preparation:

उष्ट्रप्रियाक्षुपं दग्ध्वा यत्नात् क्षारं समाहरेत् । तोयेऽष्टगुणिते क्षिप्त्वा भाजने विमले ततः ।।
सप्तकृत्वः प्रयत्नेन स्रावयेत्पृथुवाससा । स्रावितं सलिलश्चाथ पचेद् गाढं भिषग्वरः ।।
निःशेषे सलिले तत्र स्थालिकातलसंस्थितम् । हिमकुन्देन्दुसङ्काशं सर्जिक्षारं समाहरेत् ।।
(R. T. 13/45-47)

The 'pañcāṅga' of 'uṣṭra-priyā' (kṣudra durālabhā) are collected in appropriate season including all the pañcāṅga (root, stem, leaves, flowers and fruits). The plant is entirely dried under hot sun. The completely dry plant is burnt into ashes in a wide mouthed big vessel.

When cool on its own, the ash is taken in a bigger stainless steel vessel. It is added with 8 times of water, macerated well and left undisturbed overnight. Next morning the supernatant water is carefully decanted and filtered for 7 times through a thick and clean cloth.

The final filtrate is placed over mild fire and boiled over strong heat to evaporate the liquid part. The fine white powder left at the base of the vessel at the end of boiling is collected and stored as 'sarjakṣāra'.

### Sarjakṣāra- dosage:

आरभ्य रक्तित्रितयाद् रविरक्तिकसंमितम् । सर्जिक्षारं प्रयुञ्जीत बलकालाद्यपेक्षया ।। (R. T. 13/50)

Three rattī (375 mgs) to 12 rattī (1.5 gms) is the general dosage of 'sarjakṣāra'. However, the dose is fixed after taking into consideration the season, the strength of the patient and the disease etc.

Adjuvant: It is administered along with honey, water or milk.

### Sarjakṣāra- properties:

सर्जिक्षारः स्मृतस्तीक्ष्णः कटुरुष्णश्च पाचनः । समीरणहरः कामं कासश्वासनिवारणः ।।
अग्निदीप्तिकरश्चैव गुल्माध्मानविनाशनः । व्रणोदरामयहरः कृमिघ्नश्च प्रकीर्तितः ।। (R.T. 13/48-49)

Sarjakṣāra possesses tīkṣṇa guṇa, kaṭu rasa and uṣṇa vīrya. It is good digestive and mitigates vāta doṣa. It is useful in kāsa and śwāsa roga. It improves the

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appetite and cures gulma roga and ādhmāna. It heals the wounds, cures all types of udara roga and kṛmi roga.

- Other references include:

  तीक्ष्णोष्णो लघुरूक्षश्च क्लेदी पक्ता विदारणः । दहनो दीपनश्छेत्ता स्वर्जिक्षारोऽग्निसन्निभः ।।

  (C.S. Sūtra 27/306)

  ज्ञेयो वह्निसमौ क्षारौ स्वर्जिकायावशूकजौ । शुक्रश्लेष्मविबन्धार्शो गुल्मप्लीहविनाशनौ ।।

  (S.S. Sūtra 46/323)

**Sarjakṣāra- āmayika prayoga:** (R. T. 13/51-57)

1. Sarjakṣāra in the dose of three rattī (375 mg) is added with equal quantity of the fine powders of 'pippalī' and 'jīraka'; and administered daily to improve both the appetite and the digestion.
2. In vāta-kaphaja 'śwāsa' and 'kāsa' roga, 'sarjakṣāra' is administered daily in suitable dosage along with 'vāsā rasakriyā' and 'honey'.
3. In case of 'amlapitta' and 'amlodgāra', 'sarjakṣāra' in the dose of four rattī (500 mgs) is administered daily along with 'cold water'. This provides instant relief from hyper-acidity.
4. In 'ādhmāna' and 'kṛmija hṛdroga', 'sarjakṣāra' is administered daily for three days in suitable dosage along with fine powders of 'ajamoda' and 'trikaṭu'.
5. In 'vātaja gulma' roga, 'sarjakṣāra' is administered daily in suitable dosage along with 'ketakī kṣāra' and 'kuṣṭha cūrṇa' added with 'tila taila'.
6. To combat the severe pain of acute 'gulma roga', 'sarjakṣāra' is administered daily in suitable dosage along with 'jaggary' followed by intake of warm water.
7. Sarjakṣāra is added with 'nimbū swarasa' and the solution is instilled into the infected ears to cure 'karṇasrāva' associated with burning sensation and pain.

## 2. YAVAKṢĀRA

(Potassium Carbonate: $K_2CO_3$)

**Yavakṣāra (Potassium carbonate):**

Potassium carbonate ($K_2CO_3$) is a white salt, soluble in water (insoluble in alcohol), which forms a strongly alkaline solution.

- In liver disorders: Promotes the well-being of the liver and increases the secretion of bile. Helps to flush away the toxins from the body and provides a natural defence to the liver from toxins of food, water, alcohol or drugs. It is a powerful rejuvenate that nourishes the lungs.

- In renal calculi: It helps to maintain efficient kidney and urinary functions and reduces renal discomfort. It is effective in most urinary tract disorders and promotes the flow of urine and cools, soothes the membranes of the urinary tract, aids the discharge of stones. It stops bleeding and strengthens the kidney function.

**Yavakṣāra- synonyms:**

यवक्षारो यवापत्यं यवजो यवशूकजः । यव्यो यवाग्रजश्चैव यवाह्वो यवनालजः ॥
यवशूको यावशूकः शूकजो यावशूकजः । याव्यस्तथैव पाक्यश्च समाख्यातो भिषग्वरैः ॥
(R. T. 13/1-2)

Yavakṣāra, yavāpatya, yavaja, yavaśūkaja, yavya, yavāgraja, yavāhva, yavanālaja, yavaśūka, yāvaśūka, śūkaja, yāvaśūkaja, yāvya and pākya; all these are the synonymous words used in the classics to identify this drug.

**Yavakṣāra- brief history:**

Yavakṣāra has a long history. Its references can be traced from the 'Saṁhitā period'. At many places of 'Caraka Saṁhitā' and 'Suśruta Saṁhitā', this drug is used as an ingredient in compound formulations.

Yavakṣāra is counted in 'kṣāradwaya', 'kṣāratraya', 'kṣārapañcaka' and 'kṣārāṣṭaka'. This drug is required in many pharmaceutical procedures of mercury; therefore, it has a significant place in the books of 'Rasaśāstra'.

**Yavakṣāra- method of preparation:**

यवशूकभवं भस्म समादाय भिषग्वरः । सलिलेऽष्टगुणे क्षिप्त्वा विमले भाजने ततः ॥
सप्तवारं प्रयत्नेन स्रावयेत्पृथुवाससा । स्रावितं सलिलञ्चाथ चुल्ल्यां तीव्राग्निना पचेत् ॥
निःशेषं सलिलं ज्ञात्वा पाकपात्रतलस्थितम् । यवक्षारं प्रयत्नेन गृह्णीयात्पाण्डुरप्रभम् ॥ (R. T. 13/3-5)

The 'pañcāṅga' of 'yava' are collected in appropriate season including all the pañcāṅga (root, stem, leaves, flowers and fruits). The plant is entirely dried under hot sun. The completely dry plant is burnt into ashes in a wide mouthed big vessel.

When cool on its own, the ash is taken in a bigger stainless steel vessel. It is added with 8 times of water, macerated well and left undisturbed overnight. Next morning the supernatant water is carefully decanted and filtered for 7 times through a thick and clean cloth.

The final filtrate is placed over mild fire and boiled over strong heat to evaporate the liquid part. The fine white powder left at the base of the vessel at the end of boiling is collected and stored as 'yavakṣāra'.

Note: See that the dried plant should be minimum of 10 kgs. With this quantity it is possible to obtain minimal quantity of kṣāra.

**Yavakṣāra dosage:**

आरभ्य रक्तित्रितयाद् दशरक्तिकसंमितम् । यवक्षारं प्रयुञ्जीत बलकालाद्यपेक्षया ।। (R. T. 13/9)

From three rattī (375 mgs) to 10 rattī (1.2 gms) is the dose of 'yavakṣāra'. The dose has to be finalized considering the patient's strength, disease strength, season etc.

Adjuvant: It is administered along with honey, water or milk.

**Yavakṣāra- properties:**

यवक्षारो लघुः स्निग्धो दीपनः पाचनः परम् । गुल्मप्लीहामयहरः कफहा वातनाशनः ।।
शूलानाहोदराध्मानमूत्रकृच्छ्रप्रणाशनः । कण्ठामयहरो हृद्यश्चाम्लपित्तहरः सरः ।।
औपसर्गिकमेहोत्यफलशोथनिवारणः । स्वेदप्रवर्तकश्चैव भिषग्भिर्मूत्रलो मतः ।। (R. T. 13/6-8)

Yavakṣāra possesses laghu-snigdha guṇa. It is a good appetizer and a very good digestive. It cures gulma roga, plīha roga and is useful in the diseases of kapha and vāta doṣa. It is beneficial in udara-śūla, ānāha, ādhmāna, mūtrakṛcchra, kaṇṭhagata roga, hṛdroga and amlapitta. It improves the intestinal motility. It is useful in all types of aupasargika roga, prameha roga and inflammation in testicles. It causes perspiration and is diuretic.

- Other references include;

यवक्षारः कटूष्णश्च कफवातोदरार्तजित् । आमशूलाश्मरीकृच्छ्रविषदोषहरः सरः ।।
(Rasāmṛta 7/20)

हृत्पाण्डुग्रहणीरोगप्लीहानाहगलग्रहान् । कासं कफजमर्शांसि यावशूको व्यपोहति ।।
(Caraka Sūtra 27/305)

ज्ञेयो वह्निसमौ क्षारौ स्वर्जिकायावशूकजौ । शुक्रश्लेष्मविबन्धार्शो गुल्मप्लीहविनाशनौ ।।
(S.S. Sūtra 46/323)

**Yavakṣāra- āmayika prayoga:** (R. T. 13/10-32)

1. In 'makkala śūla', the 'yavakṣāra' is administered daily in suitable dosage along with 'warm water' or 'ghee'.
2. To improve the appetite and digestion, the 'yavakṣāra' is administered daily before and after meals in suitable dosage along with 'jīraka cūrṇa' and 'trikaṭu cūrṇa'.
3. To cure gulma and plīhā roga, the 'yavakṣāra' is administered daily in suitable dosage along with fine powders of 'rohitaka' and 'śarapuṅkha'.
4. In 'basti-śūla', the 'yavakṣāra' is added with equal quantities of 'marīca

cūrṇa' and 'śuṇṭhī cūrṇa' and administered twice or thrice daily in suitable dosage along with warm water.

5. To cure 'mūtrakṛcchra roga' associated with burning sensation and inflammation, the 'yavakṣāra' is administered daily in suitable dosage along with fine powder of 'elā' added with 'sugar'.
6. To cure 'mūtrakṛcchra roga' due to constipation, the 'yavakṣāra' is administered daily in suitable dosage along with 'gokṣura kaṣāya'.
7. In the initial stages of 'mūtrakṛcchra' and 'aśmarī', the 'yavakṣāra' is administered daily in suitable dosage along with 'butter milk'.
8. To cure 'mūtrakṛcchra roga', the 'yavakṣāra' is administered daily in suitable dosage along with 'kūṣmāṇḍa swarasa' added with sugar.
9. In 'vātaja udararoga', the 'yavakṣāra' is administered daily in suitable dosage along with the fine powders of 'ajamoda', 'trikaṭu' and 'pippalī'.
10. In 'plīha vṛddhi' and associated pain, 'yavakṣāra' added with the fine powders of 'śuddha hiṅgu', 'trikaṭu', 'kuṣṭha' and 'saindhava lavaṇa' and administered daily in suitable dosage along with 'nimbū swarasa'.
11. The 'yavakṣāra' administered daily in suitable dosage along with 'nimbū swarasa' encourages perspiration and micturition; as a result, the fever comes down.
12. In tridoṣaja 'udara-śūla', 'yavakṣāra' is administered daily in suitable dosage along with the fine powders of 'śaṅkha bhasma', 'trikaṭu' and 'saindhava lavaṇa' added with 'warm water'.
13. In 'excessive micturition', 'yavakṣāra' is administered daily in suitable dosage along with 'vāsā swarasa'.
14. In 'aupasargika meha', 'yavakṣāra' is administered daily in suitable dosage along with 'babbūla swarasa' or the gummy exudate of babbūla.
15. In 'pārśwa-basti-hṛdaya śūla', 'yavakṣāra' is administered daily in suitable dosage along with 'śīgru kaṣāya' and 'honey'.
16. The 'yavakṣāra' is added with 'kaṭu taila' and applied daily on the affected part; it cures 'sidhma kuṣṭha'.
17. In 'hṛdaya śūla' associated with 'hydrothorax', 'yavakṣāra' is administered daily in suitable dosage along with 'śweta punarnavā swarasa'.
18. To cure 'basti śūla' and 'mūtrāvarodha', 'yavakṣāra' is administered daily in suitable dosage along with 'tilakṣāra' and 'nimbū swarasa'.
19. In 'vātaja aśmarī roga', 'yavakṣāra' is administered daily in suitable dosage along with 'śuṇṭhī cūrṇa', 'gokṣura cūrṇa', 'varuṇa kaṣāya' and 'guḍa'.

20. In 'mūtrāghāta' and 'śukrāśmarī', 'yavakṣāra' is administered daily in suitable dosage along with 'kūṣmāṇḍa swarasa' and 'guḍa'.
21. In 'basti śūla' and 'aśmarī', 'yavakṣāra' is administered daily in suitable dosage along with decoctions of 'pāṣāṇa bheda', 'varuṇa' and 'gokṣura'.
22. In 'aupasrgika meha', 'yavakṣāra' is administered daily in suitable dosage along with 'sārivā kwātha'.
23. In case of 'gulma', 'śūla', 'hṛdroga', 'kāsa' and 'śwāsa' roga, 'yavakṣāra' is administered daily in suitable dosage along with 'daśamūla kwātha' added with 'saindhava lavaṇa'.

## 3. ṬAṄKAṆA KṢĀRA

(Borax)

**Ṭaṅkaṇa kṣāra (borax)- general information:**

**Borax**, also known as **sodium borate, sodium tetraborate**, or **disodium tetraborate**, is an important boron compound, a mineral, and a salt of bori acid. It is usually a white powder consisting of soft colorless crystals that dissolve easily in water.

Borax has a wide variety of uses. It is a component of many detergents, cosmetics, and enamel glazes. It is also used to make buffer solutions in biochemistry, as a fire retardant, as an anti-fungal compound for fiberglass, as a flux in metallurgy, neutron-capture shields for radioactive sources, a texturing agent in cooking, and as a precursor for other boron compounds.

The term *borax* is used for a number of closely related minerals or chemical compounds that differ in their crystal water content, but usually refers to the decahydrate. Commercially sold borax is usually partially dehydrated.

**Etymology:**

The word *borax* is Arabic. The Arabic is said to be from the Persian *burah*, a word that may have meant potassium nitrate or another fluxing agent.

**Occurrence:**

Borax was first discovered in dry lake beds in Tibet and was imported via the Silk Road to Arabia. Borax first came into common use in the late 19th century when Francis Marion Smith's Pacific Coast Borax Company began to market and popularize a large variety of applications under the famous 20 Mule Team Borax trademark, named for the method by which borax was originally hauled out of the California and Nevada deserts in large enough quantities to make it cheap and commonly available.

### Ṭaṅkaṇa kṣāra- synonyms:

टङ्कणष्टङ्कनश्चैव टङ्कष्टङ्गश्च टङ्गण: । द्रावकष्टङ्कणक्षारष्टङ्कक्षारश्च कथ्यते ।।
रंगक्षारस्तथा रंगो रंगदो लोहशोधन: । लोहशोधनकश्चापि कीर्तित: स्वर्णशोधन: ।।
सौभाग्यश्च सितक्षार: श्वेतक्षारश्च टंकक: । क्षारराजश्च कथितो रसायनविशारदै: ।।
(R. T. 13/72-74)

Ṭaṅkaṇa, ṭaṅkana, ṭaṅka, ṭaṅga, ṭaṅgaṇa, drāvaka, ṭaṅkaṇa-kṣāra, raṅga-kṣāra, raṅga, raṅgada, loha-śodhana, swarṇa-śodhana, soubhāgya, sitakṣāra, śweta-kṣāra, ṭaṅgaka and kṣārarāja; all these are the synonymous words used in the classics with which this drug is identified.

### Ṭaṅkaṇa kṣāra- brief history:

Ṭaṅkaṇa kṣāra has a long history. Its references can be traced from the 'Saṁhitā period'. At many places of 'Caraka Saṁhitā' and 'Suśruta Saṁhitā', this drug is used as an ingredient in compound formulations.

Ṭaṅkaṇa kṣāra is counted in 'kṣāratraya', 'kṣārapañcaka' and 'kṣārāṣṭaka'. This drug is required in many pharmaceutical procedures of mercury; therefore, it has a significant place in the books of 'Rasaśāstra'. It is used as an antidote case of many poisons.

### Ṭaṅkaṇa kṣāra- types:

1. Ṭaṅkaṇa : White coloured (common variety)
2. Nīla ṭaṅkaṇa : Blue coloured (special variety and śreṣṭha)

### Ṭaṅkaṇa kṣāra śodhana- necessity:

अशुद्धष्टङ्कणो वान्ति भ्रान्तिकारी प्रयोजित: । अतस्तं शोधयेदेव वह्नावुत्फुल्लित: शुचि: ।।
(Āy. Pra. 2/244)

Administration of 'aśuddha ṭaṅkaṇa' causes vomiting and giddiness. Therefore, it is most necessary to purify 'ṭaṅkaṇa' before therapeutic administration.

### Ṭaṅkaṇa śodhana:

#### 1. Ṭaṅkaṇa kṣāra- nirmalikaraṇa:

टङ्कणं चूर्णितं तोये तत्त्वसङ्ख्यगुणे भिषक् । सन्द्राव्य वस्त्रपूतञ्च कृत्वा चुल्ल्यां निधापयेत् ।।
तीव्राग्निना पचेत्कामं नीरं च परिशोषयेत् । स्वल्पनीरांशशेषे च टङ्कणं निर्मलं हरेत् ।।
(R. T. 13/75-76)

One part of 'ṭaṅkaṇa' is diluted with 24 parts of clean water. The solution is filtered once and the filtrate is taken in a clean stainless steel vessel. The vessel is placed over mild fire and boiled to evaporate all the liquid part. When thick solution like material is left out at the base, the heating is stopped and the drug material is dried completely under sun. Later it is stored as 'boric acid' in a suitable container.

**Note:** After 'nirmalīkaraṇa', the drug is called 'boric acid'. However, for internal administration, the drug has to undergo 'śodhana' method, explained below.

**2. Ṭaṅkaṇa kṣāra- śodhana:**

> सुचूर्णितं टङ्कणं तु खलु पञ्चपलोन्मितम् । समुज्ज्वलोदरे क्षुद्रकटाहे विन्यसेत्ततः ।।
> चुल्लिकायां निधायाथ पचेद् दर्व्या प्रचालयन् । सुपुष्पितं नष्टनीरं शुद्धिमायाति टङ्कणम् ।।

(R. T. 13/77-78)

Five pala (250 gms) of 'ṭaṅkaṇa' is taken in a clean wide mouthed iron vessel (kaḍhāhī). The vessel is placed over fire and heated with regular stirring. When the drug loses all its moisture and becomes light and brittle like 'pop-corn', the heating is stopped and the drug is stored in suitable container as 'śuddha ṭaṅkaṇa'.

**Ṭaṅkaṇa kṣāra dosage and adjuvant:**

From one to two rattī (125 to 250 mgs) is the dose of 'ṭaṅkaṇa kṣāra'. The dose has to be finalized considering the patient's strength, disease strength, season etc.

Adjuvant: It is administered along with honey, water or milk.

**Ṭaṅkaṇa kṣāra- properties:**

> टङ्कणः कटुरुष्णश्च रुक्षस्तीक्ष्णश्च सारकः । कफविश्लेषणो हृद्यो वातामयनिषूदनः ।।
> कासश्वासहरः कामं स्थावरादिविषापहः । अग्निदीप्तिकरश्चापि भृशमाध्माननाशनः ।।
> स्त्रीपुष्पजननो बल्यो विविधव्रणनाशनः । पित्तकृच्च समाख्यातो मूढगर्भप्रवर्तकः ।।

(R. T. 13/79-81)

Śuddha ṭaṅkaṇa possesses kaṭu rasa, uṣṇa vīrya, tīkṣṇa-rūkṣa-sāraka guṇa. It mitigates vitiated kapha doṣa. It is good to heart and mitigates vāta doṣa. It is useful in kāsa and śwāsa roga. It nullifies the toxic effects of sthāvara and other such poisons. It is a good appetizer and relieves ādhmāna.

It encourages contractions in the uterus leading to healthy menstrual periods. As it is a digestive, it indirectly improves body nourishment and strength. This medicine is brought in different topical dosage forms and used for cleaning and healing of the wounds. It vitiates pitta doṣa. It opens up the cervix and helps to evacuate 'mūḍha garbha'.

- Another reference:

> टङ्कणोऽग्निकरो रूक्षः कफघ्नो वातपित्तकृत् । टङ्कणो वह्निकृत्स्वर्णरूप्ययोः शोधनः परः ॥
> विषदोषहरो हृद्यो वातश्लेष्मविकारनुत् ॥ (Āy. Pra. 2/243-245)

**Ṭaṅkaṇa kṣāra- compound formulations:**

1. Ānanadabhairava rasa
2. Mṛtyuñjaya rasa
3. Trailokyacintāmaṇī rasa
4. Kanakasundara rasa
5. Pratāpalaṅkeśwara rasa
6. Sannipātabhairava rasa
7. Ṭaṅkaṇāmṛta malahara

## 4. SŪRYAKṢĀRA/SORAKA

(Potassium Nitrate)

**Sūrya kṣāra (Potassium nitrate)- introduction:**

Potassium nitrate is a chemical compound with the formula $KNO_3$. It is an ionic salt of potassium ions $K^+$ and nitrate ions $NO_3^?$. It occurs as a mineral niter and is a natural solid source of nitrogen. Potassium nitrate is one of several nitrogen-containing compounds collectively referred to as saltpeter. Major uses of potassium nitrate are in fertilizers, food additive, rocket propellants and fireworks; it is one of the constituents of gunpowder.

Potassium nitrate is moderately soluble in water, but its solubility increases with temperature. The aqueous solution is almost neutral, exhibiting pH 6.2 at 14$^0$C for a 10% solution of commercial powder. It is not very hygroscopic, absorbing about 0.03% water in 80% relative humidity over 50 days. It is insoluble in alcohol and is not poisonous; it can react explosively with reducing agents, but it is not explosive on its own.

**Pharmacology:**

- Used in some toothpastes for sensitive teeth. Recently, the use of potassium nitrate in toothpastes for treating sensitive teeth has increased and it may be an effective treatment.
- Used in some toothpastes to relieve asthma symptoms.
- Used historically to treat asthma as well as arthritis.
- Combats high blood pressure and was once used as a hypotensive.

Potassium nitrate was once thought to induce impotence, and is still falsely rumored to be in institutional food (such as military fare) as an an aphrodisiac; however, there is no scientific evidence for such properties.

**Sūrya kṣāra/soraka- synonyms:**

> सोरक: सोरकञ्चैव सोरा सैवेह सोरका । सूर्यक्षारोऽथ मृत्क्षारो वह्निक्षारश्च कीर्तित: ।।

(R. T. 14/27)

Soraka, sorā, saiveha, sorakā, sūryakṣāra, mṛtkṣāra and vahnikṣāra; all these are the synonymous words with which this drug is identified in the classics.

**Sūrya kṣāra/soraka- brief history:**

Sūrya kṣāra or soraka has a long history. Its references can be traced from the 'Saṁhitā period'. At many places of 'Caraka Saṁhitā' and 'Suśruta Saṁhitā', this drug is used as an ingredient in compound formulations. This drug is required in many pharmaceutical procedures of mercury; therefore, it has a significant place in the books of 'Rasaśāstra'.

**Sūrya kṣāra/soraka- nirmalīkaraṇa:**

> पलोन्मितं सोरकन्तु शीतले सलिले भिषक् । चतुष्पलमिते क्षिप्त्वा वस्त्रपूतं पचेत्तत: ।।
> स्वल्पशेषं जलं ज्ञात्वा पात्रमुत्तारयेत्तत: । विमलं चूर्णसङ्काशं सोरकन्तु समाहरेत् ।।
> स्वल्पशेषेऽपि सलिले यदि वह्नि: प्रदीयते । जले नि:शेषतां याते सोरकं दह्यते स्वयम् ।।
> तस्माद्रसायनाचार्य: सावधानतया सदा । सोरकं निर्मलीकुर्यात्र स्याद् द्रव्यक्षतिर्यथा ।।

(R. T. 14/29-32)

One pala (50 gms) of 'soraka' is diluted in four pala (200 ml) of cold water. The liquid is filtered once through a clean cloth. The filtrate is taken in a clean stainless steel vessel placed over mild fire. The liquid is boiled and evaporated until only little quantity of liquid is left at the base of the vessel. Soon the vessel is taken out from fire and allowed to cool on its own.

The remaining liquid part may be evaporated by placing vessel under sun. Later the dry powder of 'soraka' is collected and stored in suitable airtight container as 'nirmalīkṛta soraka'.

Note: If the liquid is boiled until the end to lose all the liquid part, the 'soraka' will be burnt. Therefore, it is better to stop boiling with little part of liquid left out and later dry it up under sun.

**Sūrya kṣāra/soraka- śodhana:**

> अत्युष्णं सलिलं स्वच्छं सोरकस्यार्द्धभागिकम् । आदाय विमले पात्रे निक्षिपेत्तु भिषग्वरै: ।।
> निक्षिप्य सोरकं वस्त्रपूतञ्च शीततां नयेत् । शलाकाकारतां यातं सोरकन्तु समाहरेत् ।।

(R. T. 14/33-34)

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One part of 'soraka' is added with half part of 'very hot water'. When the drug is completely dissolved, the liquid is filtered once through a clean cloth and the filtrate is allowed to cool down on its own. When the liquid cools down, the 'śalākākāra soraka' are dried and stored in suitable airtight container.

**Sūrya kṣāra/soraka śodhana:**

सोरकं चूर्णितं खल्वे त्वेलातोयेन भावयेत् । त्रिवारं भावनादेव शुद्धिमायात्यनुत्तमाम् ।।
(R. T. 14/35)

The 'nirmalīkṛta soraka' is taken in a clean khalva yantra in required quantity. It is triturated to powder form and subjected to 3 bhāvanās with 'elā hima'. Later the dry powder of 'soraka' is stored in suitable airtight container as 'śuddha soraka'.

Note: The purification with above method will leave the drug with pleasant odour and imparts good diuretic (mūtrala) property to the drug. For external use of the drug, the 'śodhana' may not be so essential.

**Sūrya kṣāra/soraka- dosage:**

द्विगुञ्जतः समारभ्य दशगुञ्जोन्मितं परम् । सोरकं विनियुञ्जीत बलकालाद्यपेक्षया ।। (R. T. 14/37)

Two rattī (250 mgs) to 10 rattī (1 gm) is the general dosage of 'śuddha soraka' for internal administration. However, the dosage is finalized after thorough consideration of all the relevant factors.

**Sūrya kṣāra/soraka- properties:**

सोरकः कटुकस्तीक्ष्णो विशेषाल्लवणः सरः । वह्निप्रदीपकाऽत्युष्णस्त्वाग्नेयास्त्रार्थसिद्धिकृत् ।।
(R. T. 14/28)

Soraka possesses kaṭu rasa and tīkṣṇa guṇa. It also possesses lavaṇa rasa in special. When administered internally it improves the appetite. It has uṣṇa vīrya and is cold to touch. This drug is used commercially for preparation of lethal bombs and weapons.

- Another reference:

सोरकः कटुकस्तीक्ष्णो विदग्धाजीर्णनाशनः । अश्मरीमूत्रकृच्छ्राग्निमान्द्यपाण्डुप्रमेहनुत् ।।
(R. T. 14/36)

The purified 'soraka' possesses kaṭu rasa and tīkṣṇa guṇa. Its judicious use for internal administration cures 'vidagdhājīrṇa'. It is also useful in mūtrāśmarī, mūtrakṛcchra, agnimāndya, pāṇḍu and prameha roga.

❀

## Chapter 24
# VIṢOPAVIṢA
## (Poisons and Sub-poisons)

**Introduction:**

The poisons and sub-poisons are studied in detail for their influence over the body and its management in 'Agada Tantra' another significant branch of Āyurveda. Here some of the selected poisons and sub-poisons that are required in pharmaceutical procedures of mercury are studied only from the pharmaceutical viewpoint.

We all know that with appropriate use (after proper purification); even a sharpest poison can be a good life saving medicine. On the contrary, with improper use, even a good medicine can be as hazardous as a poison to our body.

> योगादपि विषं तीक्ष्णमुत्तमं भेषजं भवेत्। भेषजं चापि दुर्युक्तं तीक्ष्णं सम्पद्यते विषम् ।।
>
> (C. S. Sū. 1/126)

The method adopted to purify any 'viṣadravya', helps not only to eradicate the toxicity of the drug but also imbibes additional therapeutic properties and makes the drug more users friendly.

Since these 'viṣadravya' are to be administered in very small dosage with extra caution, the physician is expected use his 'yukti' during their use for therapeutic purposes. Administration in larger doses of even a purified 'viṣadravya' may induce toxicity and may prove to be fatal.

**Viṣa- etymology:**

> दृष्ट्वैतद् यद्विषीदन्ति जनास्तस्माद्विषं मतम्। नरं वा विषिणीत्येतन्मृत्युपाशैस्ततो विषम् ।।
>
> (R. T. 24/1)

The sthāvara or jaṅgama dravya, which induce toxic symptoms in the body when inhaled, consumed in un-purified form are called as 'viṣa dravya' (poisonous drugs).

The verse above says that, by mere look of these 'viṣa dravya' the humans and other animals and birds become 'viṣāṇṇa' (toxic). Therefore, these drugs are called as 'viṣa' dravya and these drugs make the life of humans miserable and fatal.

### Viṣa- synonyms and types:

विषं क्ष्वेडञ्च गरलं कालकूटञ्च तन्मतम् । स्थावरं जङ्गमञ्चेति द्विविधं विषमुच्यते ॥ (R.T. 24/2)

Viṣa is also called as ‘kṣweḍa’, ‘garala’ and ‘kālakūṭa’ in classics. The ‘viṣa dravya’ can be classified into two types depending on their source;

| | |
|---|---|
| **1. Sthāvara viṣa** | Sthāvara viṣa includes the poisonous drugs from mineral and plant origin. |
| **2. Jāṅgama viṣa** | The ‘jāṅgama viṣa’ includes the toxic effects of animal and insect bites (snake, scorpion, rats, spider etc). |

### Sthāvara-jaṅgama viṣa swarūpa:

खन्यौषधाश्रयम् यत्तु विषं तत्स्थावराह्वयम् । सर्पादिजन्तुप्रभवं विषं जङ्गमसंज्ञकम् ॥ (R. T. 24/3)

The drugs that are obtained from the mineral ores, such as; gourīpāṣāṇa (arseneous trioxide; $As_2O_3$), haratāla (arsenic trisulphide; $As_2S_3$), manaḥśilā (arsenic disulphide; $As_2S_2$), pārada (hydrargirum; Hg) etc; and the drugs obtained from the herbal source, such as; vatsanābha (Aconitum ferox), kucalā (strychnos nuxvomica), guñjā (abrus precatorious), dhattūra (datura metel) etc; all these are called as ‘sthāvara viṣa’.

The poison induced from the animal and insect bites, such as the bites of snake, scorpion, spider, dog, jackal, wolf, or any other animal or insect which are poisonous.

### Sthāvara viṣa- adhiṣṭhāna bheda (10):

कन्दः सारोऽथ निर्यासः पुष्पं मूलं फलं दलम् । त्वक् क्षीरं खनिरित्यस्य ह्यधिष्ठानानि वै दश ॥

(R. T. 24/5)

Depending on ‘adhiṣṭhāna’ (source), the ‘sthāvara viṣa’ is categorized into ten types. They are:

| Sl No. | Adhiṣṭhāna bheda | Poisonous part of the plant |
|---|---|---|
| 1 | Kanda viṣa | Tubers |
| 2 | Sāra viṣa | Essence |
| 3 | Nirayāsa viṣa | Exudates |
| 4 | Puspa viṣa | Flower |
| 5 | Mūla viṣa | Roots |
| 6 | Patra viṣa | Leaves |
| 7 | Phala viṣa | Fruits |
| 8 | Twak viṣa | Bark |
| 9 | Kṣīra viṣa and | Milky exudate |
| 10 | Khanija viṣa | Dhātu |

**Sthāvara viṣa- 2 types:**

विषं चोपविषं चेति द्विविधं स्थावरं विषम् । प्रथमं वत्सनाभादि द्वितीयं तिन्दुकादिकम् ।।

(R. T. 24/6)

Sthāvara viṣa are again divided as **1. Mahāviṣa** and **2. Upaviṣa**;

- **Mahāviṣas** are 9 in number; they are; 1. Hālāhala viṣa 2. Kālakūṭa viṣa 3. Śṛṅgīka viṣa 4. Pradīpana viṣa 5. Sourāṣṭrika viṣa 6. Brahmaputra viṣa 7. Hāridra viṣa 8. Saktuka viṣa and 9. Vatsanābha viṣa (Aconitum ferox);
- **Upaviṣas** are 11 in number; they are; 1. Viṣatinduka (Strychnous nuxvomica) 2. Ahiphena (Papaver someniferum) 3. Jayapāla (Croton tiglium) 4. Dhattūra bīja (Datura metel) 5. Vijayā (bhāṅga; Cannabis sativa) 6. Guñjā (Abrus precatorius) 7. Bhallātaka (Semecarpus anacardium) 8. Arka kṣīra (miky exudate of Calotropis procera) 9. Snuhī kṣīra (milky exudate of Euphorbia neriifolia) 10. Lāṅgalī (Gloriosa superba) 11. Karavīra (Nerium indicum).

**Mahāviṣa- 9 types:**

हालाहलः कालकूटः श्रृङ्गकश्च प्रदीपनः । सौराष्ट्रिको ब्रह्मपुत्रो हारिद्रः सक्तुकस्तथा ।।
वत्सनाभ इति ज्ञेया विषभेदा अमी नव । रसे रसायनादौ च वत्सनाभः प्रशस्यते ।।
विषाणां सक्तुकान्तानां प्रयोगो नेह दृश्यते । अतस्त्वेषां विषाणां तु स्वरूपं न प्रदर्शितम् ।।

(R. T. 24/7-9)

1. Hālāhala viṣa 2. Kālakūṭa viṣa 3. Śṛṅgīka viṣa 4. Pradīpana viṣa 5. Sourāṣṭrika viṣa 6. Brahmaputra viṣa 7. Hāridra viṣa 8. Saktuka viṣa and 9. Vatsanābha viṣa; are the nine 'mahā viṣa' enlisted.

Out of these nine, only 'vatsanābha' (Aconitum ferox) is the one, which is considered best for 'rasa-kriyā' and for the 'rasāyana' purposes. In fact, it is the only one, which is in use presently.

All the remaining viṣas (from 1 to 8) are unknown to the pharmaceutical or therapeutic world and the explanation about them is quite obscure in classics.

| VIṢA CLASSIFICATION | | | |
|---|---|---|---|
| **Sthāvara viṣa** | | **Jāṅgama viṣa** | **Saṁyogaja viṣa** |
| **Mahāviṣa (9)** | **Upaviṣas (11)** | **Animal/insect bites (innumerable)** | **Kṛtrima viṣa (artificial poisons)** |
| 1. Hālāhala viṣa | 1. Viṣatinduka | 1. Snake bite | 1. Gara viṣa (aviṣa-dravya-saṁyoga) |
| 2. Kālakūṭa viṣa | 2. Ahiphena | 2. Scorpion bite | |
| 3. Śṛṅgīka viṣa | 3. Jayapāla | 3. Rat bite | |
| 4. Pradīpana viṣa | 4. Dhattūra bīja | 4. Spider bite | 2. Kṛtrima viṣa |

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| Sthāvara viṣa | | Jāṅgama viṣa | Saṁyogaja viṣa |
|---|---|---|---|
| **Mahāviṣa (9)** | **Upaviṣas (11)** | **Animal/insect bites (innumerable)** | **Kṛtrima viṣa (Artificial poisons)** |
| 5. Sourāṣṭrika viṣa<br>6. Brahmaputra viṣa<br>7. Hāridra viṣa<br>8. Saktuka viṣa and<br>9. Vatsanābha viṣa (Aconitum ferox) | 5. Vijayā<br>6. Guñjā<br>7. Bhallātaka<br>8. Arka kṣīra<br>9. Snuhī kṣīra<br>10. Lāṅgalī<br>11. Karavīra | 5. Dog bite<br>6. Jackal bite<br>7. Wolf bite<br>8. Insect bite etc (Viṣa adhiṣṭhāna-16) | (saviṣa-dravya--saṁyoga) |

## Viṣadravya- collection:

उद्धरेत्फलपाके तु नवं स्निग्धं घनं गुरु । अव्यावृत्तं विपच्चैस्तु वातादिभिरशोषितम् ।। (Āy. Pr. 6/48)

The poisonous herbal drugs (upaviṣa) are to be collected when these plants are at their peak potency level i.e. at the time of their fruiting season. The plant should be newly grown; it should possess snigdha (smooth), ghana (hard and solid) and guru (heavy) guṇa.

These plants should be collected from the place where anti-poisonous drugs are not grown. They should not be dry due to harsh climatic conditions. Such drugs are collected and used for the purpose of purification.

## Viṣa- 10 properties:

लघुरूक्षमाशु विशदं व्यवायि तीक्ष्णं विकासि सूक्ष्मं च । उष्णमनिर्देश्यरसं दशगुणयुक्तं विषं तज्ज्ञैः ।।

(C. S. Ci. 23/24)

| Sl No. | Ten properties of Viṣa Dravya | |
|---|---|---|
| 1 | Laghutwa | Lightness |
| 2 | Rūkṣatwa | Dryness |
| 3 | Āśukāritwa | Quick acting ability |
| 4 | Viśadatwa | Non-slimy |
| 5 | Vyavāyī | Quickly absorbed |
| 6 | Tīkṣṇatwa | Sharpness |
| 7 | Vikāsi | Slackening |
| 8 | Sūkṣmatwa | Sūkṣmasrotogāmitwa |
| 9 | Uṣṇa | Uṣṇa vīryatwa |
| 10 | Anirdeśa rasa | Indistinct taste |

## Viṣadravya śodhana- necessity:

ये दुर्गुणा विषेऽशुद्धे ते स्युर्हीना विशोधिते । तस्माद्विषं प्रयोगेषु शोधितं योजयेद्भिषक् ।।

(Āy. Pr. 6/47-48)

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Since the poisonous drugs lose all their toxic effects after proper purification, these poisonous drugs are to be subjected to appropriate purification. Moreover, the purification process adds to the therapeutic efficacy of these drugs.

**Viṣadravya- sāmānya śodhana:**

कृत्वा चणकवत्स्थूलान् विषभागास्तु भाजने । तत्र गोमूत्रकं क्षिप्त्वा प्रत्यहं नित्यनूतनम् ॥
शोषयेत्त्रिदिनादूर्ध्वं धृत्वा तीव्रातपे ततः । प्रयोगेषु प्रयुञ्जीत भागमानेन तद्विषम् ॥
गोदुग्धे घटिकाः पञ्च शुद्धिमायाति तद्विषम् । (Āy. Pr. 5/49-50)

First method: The viṣa dravya is cut into smaller pieces (caṇakavat) and kept soaked in enough quantity of freshly collected cow's urine for three days. Daily, the earlier urine has to be replaced with fresh urine.

On 4th day, the drug pieces are dried under hot sun until completely dry. These dry drug pieces are now stored in suitable airtight container as 'śuddha viṣa dravya' for further pharmaceutical use.

Second method: The cut pieces of the drug are tied in a clean cloth like poṭṭalī. It is hung in dolāyantra having cow's milk as liquid media. The vessel is placed over mild fire and cooked for five prahara (15 hours).

Later the drug is washed with warm water, dried under hot sun and stored in suitable airtight container as 'śuddha viṣa dravya' for further pharmaceutical use.

**Viṣadravya- effect of śodhana:**

विषं प्राणहरं प्रोक्तं व्यवायि च विकासि च । वातश्लेष्मघ्दाग्नेयं योगवाहि मदावहम् ॥
तदेव युक्तियुक्तं तु प्राणदायि रसायनम् । पथ्याशिनां त्रिदोषघ्नं बृंहणं वीर्यवर्द्धनम् ॥
(Āy. Pr. 5/45-46)

Any 'viṣadravya' with appropriate purification will be a lifesaver drug (prāṇadāyī). It possesses rasāyana (rejuvenation), yogavāhī (synergistic action), tridoṣaghna (mitigation all the three vitiated doṣa), bṛṁhaṇa (nourishing) and vīryavardhana (aphrodisiac) properties.

**Viṣadravya- saṁrakṣaṇa:**

रक्तसर्षपतैलेन लिप्ते वाससि धारयेत् । विषं शुद्धं प्रयत्नेन नान्यत्र गुणहानितः ॥ (Āy. Pr. 5/51)

The purified 'viṣadravya' should be carefully covered with a cloth soaked in 'rakta sarṣapa taila' and placed in suitable container. By doing so, the 'viṣadravya' retains its potency for a longer period.

**Viṣadravya- eradication of viṣatwa:**

समटङ्कणसंपिष्टं तद्विषं मृतमुच्यते । योजयेत्सर्वरोगेषु न विकारं करोति च ॥

तुल्येन टङ्कणेनैव द्विगुणेनोषणेन च । विषं संयोजितं शुद्धं मृतं भवति सर्वथा ।। (Āy. Pr. 5/60-61)

The 'viṣadravya' is added with equal quantity of 'śuddha ṭaṅkaṇa' and triturated thoroughly in a clean khalva yantra. By doing so, the poisonous effects the drug will be completely lost. This procedure facilitates both purification and viṣatwa eradication of 'viṣadravya'.

### Viṣadravya prayoga:

नानारसौषधैर्ये तु दुष्टा यान्तीह नो गदाः । ते नश्यन्ति विषे दत्ते शीघ्रं वातकफोद्भवाः ।।

(Āy. Pr. 5/62)

When the disease remains incurable even after administration of different 'rasouṣadhis', the use 'śuddha viṣadravya' as medicine will be beneficial. These 'viṣadravya' are more beneficial in vāta-kaphaja roga.

### Viṣadravya sevana- unfit persons:

न क्रोधिते न पित्तार्ते न क्लीबे राजयक्ष्मिणि । क्षुतृष्णाश्रमकर्माध्यसेविनि क्षयरोगिणि ।।
गर्भिण्यां बालवृद्धेषु न विषं राजमन्दिरे । (Āy. Pr. 5/67-68)

The persons who are short tempered (of pitta prakṛti), who are suffering with pittaja roga, who are impotent, who are suffering with rājayakṣma roga, who are hungry, thirsty, tired after prolonged work and who suffer with 'kṣayaroga'; pregnant women, children, aged persons and sukumāra (rājamandira); all these people are considered unfit for administration of viṣadravya.

### Viṣadravya- dosage:

यवाष्टकं भवेद्यावदभ्यस्तं तिलमात्रया । सर्वरोगहरं नृणां जायते शोधितं विषम् ।। (Āy. Pr. 5/71)

One eighth of a 'yava' (one tila) to eight 'yava' (two rattī) (i.e. 8 mgs to 250 mgs) (1 yava is 31.25 mgs) is the general dose of any 'viṣadravya'. Proper administration of 'śuddha viṣa' is capable of curing all kinds of diseases.

### Viṣadravya sevana- pathya:

घृतं क्षीरं सितां क्षौद्रं गोधूमांस्तण्डुलान्यवान् । मरिचं सैन्धवं द्राक्षां मधुरं पानकं हिमम् ।।
ब्रह्मचर्यं हिमं देशं हिमं कालं हिमं जलम् । विषस्य सेवको मर्त्यो भजेदतिविचक्षणः ।।

(Āy. Pr. 5/78-79)

Āhāraja pathya: Ghee, milk, sugar, honey, wheat and its preparation, cooked rice, marica, saindhava, grapes, madhura pānaka and hima (cold infusions).

Vihāraja pathya: Brahmacarya, staying in cool areas, cold seasons and use of cold water. All these are considered good for the persons during consumption of 'viṣadravya'.

**General antidotes:**

1. Ṭaṅkaṇa (Borax)
2. Haridrā (Turmeric)
3. Goghṛta (Ghee)
4. Nimbū swarasa (Lemon juice)
5. Godugdha (Cow's milk)
6. Ajadugdha (Goat's milk)
7. Meghanāda rasa
8. Sarpākṣī
9. Arjuna twak
10. Putrañjīvaka
11. Vandhyā karkoṭakī
12. Gojihvā
13. Triśūlikā and
14. Sarpākṣī

All these are the prominent antidotes used in case of any toxic effects during administration of 'viṣadravya'.

## 1. VATSANĀBHA

(Aconitum ferox)

**Aconitum ferox- general information:**

Sanskrit Name : Vatsanābha
Varga : Viṣa
Latin name : Aconitum ferox
Family : Ranunculaceae
English name : Mon's hood, Indian aconite
Hindi name : Vachhanābha
Chemical Composition : Aconitin, Pseudoa-aconitin and Benzyl aconin.

**Aconitum ferox** also known as Aconitum virorum is a species of 'monk's hood', in the family 'Ranunculaceae'. It is also known as the Indian aconite. Abundant at Sandakphu, which is the highest point of the Darjeeling Hills in the Indian State of West Bengal.

A deciduous perennial that grows up to 1.0 metre tall by 0.5 metres wide and which favour many types of soil. They are handsome plants with the tall and erect stem crowned by racemes of large eye-catching blue, purple, white, yellow or pink zygomorphic flowers with numerous stamens. They are distinguished by having one of the five petaloid sepals (the posterior one), called the galea, in the form of a cylindrical helmet; hence the English name monkshood. There are 2-10 petals, in the form of nectaries. The two upper petals are large. They are placed under the hood of the calyx and are supported on long stalks.

It is from Aconitum ferox that the well-known Indian poison bikh, bish, or nabee is produced. It contains large quantities of the alkaloid pseudaconitine, which is a deadly poison. It was also used in European witchcraft ointments and has been used by poisoners.

**Toxic symptoms:**

The 'symptoms of poisoning' are usually seen within 45 minutes to an hour with numbness of the mouth and throat and vomiting after an hour that the sufficient dose was ingested. Respiration slows and blood pressure synchronously falls to within 30-40 beats per minute and the conscious mindedness stays until the end which is usually death by asphyxiation. This takes place before the arrest of the heart.

**Aconitum ferox** is considered **the most poisonous plant in the world.** Therefore it is listed out under 'viṣa varga' in the textual references of Āyurveda.

**Vatsanābha- synonyms:**

> वत्सनाभो वत्सनागः क्ष्वेडोऽस्त्री च विषं मतम् । अमृतञ्च तदेवोक्तं रसतन्त्रविशारदैः ॥
> (R. T. 24/16)

Vatsanābha is also identified as 'vatsanāga', 'kṣweḍa', 'viṣa' and 'amṛta' in classics.

**Vatsanābha- varieties:**

> कृष्णाभः कपिशः पाण्डुर्वर्णतस्त्रिविधो मतः । वत्सनाभो विशेषेण क्रमेण गुणवत्तमः ॥
> (R. T. 24/15)

Depending on the colour, the rhizome of 'vatsanābha' will be of three varieties;

1. Kṛṣṇābha (blackish)
2. Kapiśa (yellowish ashy)
3. Pāṇḍu (pale colour).

In relation with 'kṛṣṇābha' variety, the other two are therapeutically more potent.

**Vatsanābha- grāhya swarūpa:**

> स्थूलं स्निग्धं गुरु नवं फलपाकोत्तरोद्धृतम् । कीटाद्यभक्षितञ्चैव विषं ग्राह्यमिहोच्यते ॥
> (R. T. 24/17)

The rhizome of 'vatsanābha', which is selected for pharmaceutical purposes should be enough bulky and well grown, it should have smooth and shiny exterior surface, should be heavy, should be freshly collected after fruiting season and be non-infested.

**Vatsanābha part used:**

Root

**Vatsanābha śodhana- necessity:**

अविशुद्धं विषं दाहं मोहं हृद्गतिरोधनम् । मृत्युञ्च विदधात्याशु तस्मात्तं परिशोधयेत् ।।

(R. T. 24/18)

Impure or improperly purified 'vatsanābha' if administered in any form will cause acute burning sensation all over the body. It may also cause 'mūrcchā' (syncope) and cardiac arrest, which may eventually lead to the death of the patient.

Use of 'vatsanābha' in higher doses (over dose) may also lead to toxicity and death. Therefore, this medicine has to be put to therapeutic use only after proper purification.

**Vatsanābha śodhana- 1st method:**

यथोक्तगुणसंपन्नं वत्सनाभं समाहरेत् । ततश्चणकसंस्थानं खण्डशः कारयेद्भिषक ।।
पापाणचषके वापि मृत्तिकाभाजने ततः । गोमूत्रेण समाप्लाव्य स्थापयेत्प्रखरातपे ।।
प्रत्यहं पूर्वनिक्षिप्तं गोमूत्रमपनीय तु । दत्वा च नूतनं मूत्रं तीव्रघर्मे तु विन्यसेत् ।।
एवं दिनत्रयं कृत्वा त्वचामपनयेत्ततः । शोषयेच्च विषं त्वेवं शुद्धिमायात्यनुत्तमाम् ।।

(R. T. 24/19-22)

The well-grown 'vatsanābha' collected during appropriate season is cut into smaller pieces (of caṇaka size) and taken in a stone pool or a wide mouthed mud pot placed under hot sun. It is added with freshly collected 'gomūtra' (cow's urine) in enough quantity to impregnate the drug.

Daily morning, the earlier 'gomūtra' is decanted and the freshly collected 'gomūtra' is added. This practice is continued for three consecutive days. At night times, the container is covered with a suitable lid and during daytime under hot sun, it is kept open.

On fourth day, the 'vatsanābha' is taken out, the external skin is removed and the 'śuddha vatsanābha' is dried completely under hot sun. Later the dry drug is stored in suitable airtight container as 'śuddha vatsanābha' for further pharmaceutical use.

**Vatsanābha śodhana- 2nd method:**

विपं चणकसंस्थानं कृत्वा पोट्टलिकागतम् । सुरभीपयसा चेह दोलिकायन्त्रयोगतः ।।
यामद्वयं वा यामैकं स्वेदयेदतियत्नतः । संशोधितं विपं त्वेवं विशुद्ध्यति न संशयः ।।

(R. T. 24/23-24)

The well-grown 'vatsanābha' collected during appropriate season is cut into smaller pieces (of caṇaka size). The drug pieces are tied in a cloth as 'poṭṭalī' and hung in 'dolāyantra' containing enough quantity of 'godugdha' (cow's milk) as liquid media.

The 'dolāyantra' is now placed over moderate fire and the drug is subjected for 'swedana' for one yāma (3 hours) or two yāma (6 hours). Later when cool on its own, the drug inside the 'poṭṭalī' is collected, washed with warm water, dried under hot sun and stored in suitable airtight container as 'śuddha vatsanābha' for further pharmaceutical use.

**Vatsanābha śodhana- 3rd method:**

खण्डीकृतो वत्सनाभः पोट्टलीगर्भसंस्थितः । अजादुग्धेन सुस्विन्नो यामतः शुद्धिमाप्नुयात् ।।

(R. T. 24/25)

The well-grown 'vatsanābha' collected during appropriate season is cut into smaller pieces. The drug pieces are tied in a cloth as 'poṭṭalī' and hung in 'dolāyantra' containing enough quantity of 'ajadugdha' (goat's milk) as liquid media.

The 'dolāyantra' is now placed over moderate fire and the drug is subjected for 'swedana' for one yāma (3 hours). Later when cool on its own, the drug inside the 'poṭṭalī' is collected, washed with warm water, dried under hot sun and stored in suitable airtight container as 'śuddha vatsanābha' for further pharmaceutical use.

**Vatsanābha- dosage:**

कलांशतो रक्तिकाया वस्वशप्रमितं विषम् । विमलं विनियुञ्जीत बलकालाद्यपेक्षया ।।

(R. T. 24/66)

1/16 rattī to 1/8 rattī (8 to 16 mgs) is the general dosage of 'śuddha vatsanābha' for internal administration. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

Anupāna: Milk, honey any other suitable adjuvant.

**Śuddha vatsanābha- properties:**

विषं तु कतुकं तिक्तमुष्णं चैव कषायकम् । योगवाहि परं चैतन्महोत्कृष्टं रसायनम् ।।
त्रिदोषघ्नं विशेषेण मतं वातबलासनुत् । दीपनं शीतशमनं बृंहणं बलवर्द्धनम् ।।
अग्निमान्द्यप्रशमनं प्लीहोदरनिबर्हणम् । वातरक्तापहं चैव श्वासकासविधूननम् ।।
गुदामयग्रहणिकागुल्मनिर्दलनं परम् । कुष्ठपाण्डुरुज्वरहरं त्वामवातप्रणाशनम् ।।
विनिहन्ति विशेषेण तिमिरं च निशान्धताम् । अभिष्यन्दं नेत्रशोथं कर्णशोथञ्च दारुणम् ।।

dr keshav raj

कर्णशूलं शिरःशूलं गृध्रसीं कटिवेदनाम् । आखुवृश्चिकसर्पाणां विषं चैवाविलम्बितम् ॥

(R. T. 24/26-31)

Śuddha vatsanābha possesses kaṭu, tikta and kaṣāya rasa; uṣṇa guṇa; and yogavāhī (synergistic) property. When administered judiciously for internal administration, it acts like a good rejuvenator (rasāyana). It mitigates all the three vitiated doṣas. However, in special, it mitigates vitiated vāta and kapha doṣa.

It is a good appetizer. It brings down the coldness in the body and maintains body warmth. It nourishes the body and adds to the physical strength. It is useful in agnimāndya, plīhodara, vātarakta, śwāsa and kāsa roga. Its use as an ingredient in the compound formulations meant for arśa roga, grahaṇī roga and gulma roga would make the medicine more efficacious and help in complete cure of these diseases.

It is also indicated in kuṣṭha (skin diseases), pāṇḍu (anaemia), jwara (fever) and āmavāta (rheumatoid arthritis). Its prolonged use will cure chronic 'timira roga' (dizziness) and 'naktāndhyatā' (night blindness).

It is found useful in netrābhiṣyanda (conjunctivitis), netra-śotha, karṇa-śotha, karṇa-śūla, gṛdhrasī and kaṭi-śūla. Its application over affected parts will help to bring down the poisonous effects of snakebite, scorpion bite and other poisons.

**Vatsanābha- contraindications:**

न वालेष्वतिवृद्धेषु रोगिणीगर्भिणीषु च । न चातिक्षीणगात्रेषु यक्ष्मलक्ष्मयुते न च ॥
न क्रोधिते न च भ्रान्ते हृद्दौर्बल्ये विशेषतः । वत्सनाभविषं वैद्यः प्रायशो न प्रयोजयेत् ॥
एतेष्वपि प्रयोक्तव्येऽवश्यं खलु विधानवित् । यत्नतोह्यल्पकालार्थं युञ्जीतात्यल्पमात्रया ॥

(R. T. 24/61-63)

Śuddha vatsanābha is contraindicated in children, old aged, very ill patients, pregnant women, emaciated patients, patients suffering with 'rājayakṣma', in patients having anxiety, anger and giddiness and in patients with weakened heart; in all these persons, the 'śuddha vatsanābha' should not be used for internal administration.

In children suffering with any of the critical ailments in which 'śuddha vatsanābha' is indicated; and if the situation demands, this medicine can be very carefully used for internal administration in very smaller dosage and that too only for a very shorter period.

dr keshav raj

**Vatsanābha- compound formulations:**

1. Ānandabhairava rasa
2. Hiṅguleśwara rasa
3. Sūtaśekhara rasa
4. Mṛtyuñjaya rasa
5. Kaphaketu rasa
6. Pañcāmṛta rasa
7. Śivatāṇḍava rasa
8. Jayā vaṭī
9. Viṣa rasāyana
10. Amṛta rasāyana
11. Viṣaprabhā vartikā

## UPAVIṢA

(Sub-Poisons)

**Upaviṣa- names:**

विषतिन्दुकबीजं च त्वहिफेनञ्च रेचकम् । धत्तूरवीजं विजया गुञ्जा भल्लातकाह्वयः ।।
अर्कक्षीरं स्नुहीक्षीरं लाङ्गली करवीरकम् । समाख्यातो गणोऽयं तु बुधैरुपविषाभिधः ।।

(R. T. 24/163-164)

The following are the drugs of herbal origin listed out under the heading 'upaviṣa'.

| | |
|---|---|
| 1. Viṣatinduka bīja (Kucalā) | (Strychnos nuxvomica) |
| 2. Ahiphena | (Papaver somniferum) |
| 3. Jayapāla bīja (Recaka) | (Croton tiglium) |
| 4. Dhattūra bīja | (Datura metel) |
| 5. Vijayā (Bhāṅga) | (Cannabis sativa) |
| 6. Guñjā | (Abrus precatorius) |
| 7. Bhallātaka | (Semecarpus anacardium) |
| 8. Arka kṣīra | (Milky exudate of Calotropis procera) |
| 9. Snuhī kṣīra | (Milky exudate of Euphorbia neriifolia) |
| 10. Lāṅgalī | (Gloriosa superba) |
| 11. Karavīra | (Nerium indicum) |

Note: Since these eleven 'poisonous herbal drugs' are considered less toxic in comparison with the nine mahāviṣa (vatsanābha, hālāhala, kālakūṭa etc) mentioned earlier in this chapter, these are called 'upaviṣa'.

- Other reference:

लाङ्गली विषमुष्टिश्च करवीरं जया तथा । नीलकः कनकोऽर्कश्च वर्गो ह्युपविषात्मकः ।।

(R. R. S. 10/84)

1. Lāṅgalī 2. Viṣatinduka bīja (Kucalā) 3.Karavīra 4.Vijayā (Jayā or Bhāṅga) 5. Nīlaka (Bhallātaka) 6. Kanaka (Dhattūra bīja) and 7. Arka kṣīra; are the seven 'upaviṣa' as per the above reference.

## 1. VIṢATINDUKA BĪJA/KUCALĀ

(Strychnos nuxvomica)

**Viṣatinduka/Kucalā (Strychnos nuxvomica)-
general information:**

Varga : Upaviṣa
Sanskrit name : Viṣatinduka/Kucalā
English name : Nux vomica, poison nut, semen strychnos and quaker buttons
Hindi name : Kucila
Latin name : Strychnos nuxvomica
Family : Loganiaceae

The strychnine tree (Strychnos nux-vomica L.) also known as nux vomica, poison nut, semen strychnos and quaker buttons, is a deciduous tree native to India, southeast Asia. It is a medium-sized tree in the family 'Loganiaceae' that grows in open habitats. Its leaves are ovate and 2-3.5 inches (5.1-8.9 cm) in size.

It is a major source of the highly poisonous alkaloids strychnine and brucine, derived from the seeds inside the tree's round, green to orange fruit. The seeds contain approximately 1.5% strychnine, and the dried blossoms contain 1.0%. However, the tree's bark also contains brucine and other poisonous compounds.

**Strychnos nux-vomica** is a medium-sized tree with a short thick trunk. The wood is dense, hard white, and close-grained. The branches are irregular and are covered with a smooth ashen bark. The young shoots are a deep green colour with a shiny coat. The leaves have an opposite arrangement, short stalked, are oval shaped, also have a shiny coat and are smooth on both sides. The leaves are about 4 inches (10 cm) long and 3 inches (7.6 cm) wide. The flowers are small with a pale green colour with a funnel shape. They bloom in the cold season and have a foul smell. The fruit are about the size of a large apple with a smooth and hard shell which when ripened is a lovely orange colour. The meat of the fruit is soft and white with a jelly-like pulp containing five seeds covered with a soft woolly substance.

The seeds are removed from the fruit when ripe. They are then cleaned, dried and sorted. The seeds have the shape of a flattened disk completely covered with hairs radiating from the center of the sides. This gives the seeds a very characteristic sheen. The seeds are very hard, with a dark grey horny endosperm where the small embryo is housed that give off no odour but possess a very bitter taste. The plant is native to South-east Asia and Australia normally in tropical and subtropical areas.

There are no uses in modern allopathic medicine, although it was widely used in medicine before World War II. Strychnine is a deadly poison with a lethal dose to humans of about 30 to 120 mg. Survival of substantially higher doses has been reported. The properties of Nux Vomica are those of the alkaloid strychnine. Strychnine is eliminated with a half-life of about 12 hours.

**Toxic symptoms:**

The most direct symptom caused by strychnine is 'violent convulsions' due to a simultaneous stimulation of the motor or sensory ganglia of the spinal cord. During the convulsions there is a 'rise in blood pressure'. Brucine closely resembles strychnine in its action, but is slightly less poisonous as it only causes 'paralysis' of the peripheral motor nerves.

Strychnos nux-vomica has shown to suppress allergen-specific Immunoglobulin E (IgE) antibody response in mice, suggesting its possible application in allergic conditions.In vitro Strychnos nux-vomica inhibited the growth of AGS human gastric carcinoma cells.

**Viṣatinduka bīja- synonyms:**

कुचेलकं कुचेलञ्च कुचिला कुचिलं तथा । विषतिन्दुस्तथा तिन्दुस्तिन्दुकं विषतिन्दुकम् ।।
कारस्करो रम्यफलः कुपाको विषमुष्टिका । विषमुष्टिः कालकूटस्तदेव विनिगद्यते ।।

(R. T. 24/165-166)

Kucelaka, kucela, kucilā, kucila, viṣatindu, tindu, tinduka, viṣatinduka, kāraskara, ramyaphala, kupāka, viṣamiṣṭhikā and kālakūṭa; all these are the synonymous words used in the classics for the drug 'strychnos nuxvomica'.

**Viṣatinduka part used:**

Seeds

**Viṣatinduka śodhana- 1st method:**

विषतिन्दुकबीजानि विन्यसेद् गृहवारिणि । दिनत्रयं प्रयत्नेन त्वपनीय बहिस्त्वचम् ।।
निदाघे चाथ संशोष्य चूर्णयेद्भिषजां वरः । एवं विशुद्धिमायाति सर्वथा विषतिन्दुकम् ।।

(R. T. 24/172-173)

The well-grown seeds of 'Strychnos nuxvomica' are soaked in 'kāñjī' for three days. On 4th day, the seeds are removed from 'kāñjī' and wiped. Their external cover is removed and dried under sun. The dry seeds are pounded in khalva yantra and the powder obtained is filtered and stored as 'śuddha kucalā'.

**Viṣatinduka śodhana- 2nd method:**

कारस्करस्य बीजानि त्वतिमन्दाग्नियोगतः । निधाय पिष्टपचने तावदाज्येन भर्जयेत् ।।
यावद् वहिस्त्वचा किञ्चिज्जायते कपिशप्रभा । कुचेलमेवं त्वरितं शुद्धिमायात्यनुत्तमाम् ।।
(R. T. 24/174-175)

The well-grown seeds of 'Strychnos nuxvomica' are fried in an open iron vessel (kaḍhahī) along with required quantity of ghee. The process of frying is continued until the colour of the seeds become reddish yellow (kapiśa varṇa).

Soon the frying process is stopped, the external cover is removed and the seeds are pounded in khalva yantra. The powder obtained is dried, filtered and stored as 'śuddha kucalā'.

**Viṣatinduka śodhana- 3rd method:**

विषतिन्दुकबीजानि पोट्टल्यां विन्यसेद्भिषक् । स्वेदयेद् गव्यपयसा दोलिकायन्त्रमार्गतः ।।
एवं यामैकमात्रेण शुद्धिमायान्त्यनुत्तमाम् । शोधितं तिन्दुकं त्वेवं वीतशङ्कः प्रयोजयेत् ।।
(R. T. 24/176-177)

The well-grown seeds of 'Strychnos nuxvomica' are tied in a cloth like 'poṭṭalī' and hung in 'dolāyantra' having 'godugdha' as liquid media. The 'dolāyantra' is placed over mild fire and cooked for one yāma (3 hours).

When cool on its own, the seeds inside the 'poṭṭalī' are collected, the external cover is removed and the seeds are pounded in khalva yantra. The powder obtained is dried, filtered and stored as 'śuddha kucalā'.

**Viṣatinduka- dosage:**

आरभ्य गुञ्जापादांशाद् गुञ्जैकप्रमितं परम् । मात्राविद्भिनियुञ्जीत विमलं विषतिन्दुकम् ।।
(R. T. 24/203)

Quarter rattī (31 mgs) to one rattī (125 mgs) is the general dosage of 'śuddha viṣatinduka'. However, the dosage is finalized after thorough consideration of the all the relevant factors.

Anupāna:

Milk, ghee or butter.

**Viṣatinduka- properties:**

विषतिन्दुकमाग्नेयं कटुकं दीपनं परम् । उग्रवीर्यं तीक्ष्णसारं कामोद्दीपनमुत्तमम् ।। (R. T. 24/178)

The seeds of 'viṣatinduka' possess 'uṣṇa' vīrya, 'kaṭu' rasa and agni-dīpana property. By virtue of its 'ugra vīrya', the influence of these 'seeds' over body will be so acute and quick. The 'seed essence' will be still more stronger (ati-ugra vīrya). In comparison with the seeds, the seed essence will be aphrodisiac.

**Viṣatinduka- compound formulations:**

1. Agnituṇḍī rasa
2. Lakṣmīvilāsa rasa
3. Navajīvana rasa
4. Śūla-nirmūlana rasa
5. Suptivātāri rasa
6. Sārameyaviṣahara yoga
7. Viṣatinduka taila

## 2. AHIPHENA

(Papaver somniferum)

**Ahiphena (Papaver somniferum)- general information:**

Varga : Upaviṣa
Sanskrit name : Ahiphena
English name : Opium poppy, sleep-bringing poppy
Hindi name : Aphim
Latin name : Papaver somniferum
Family : Papaveraceae
Chemical composition : Morphine, Apomorphine Codein, Narcotine, Nascopine, Papverine etc.

Opium poppy or papaver somniferum, is the species of plant from which opium and poppy seeds are derived. Opium is the source of many narcotics, including morphine (and its derivative heroin), thebaine, codeine, papaverine, and noscapine. The Latin botanical name means the "sleep-bringing poppy", referring to the sedative properties of some of these opiates.

The poppy is the only species of Papaveraceae that is an agricultural crop grown on a large scale. Other species, Papaver rhoeas and Papaver argemone, are important agricultural weeds, and may be mistaken for the crop.

The plant itself is also valuable for ornamental purposes, and has been known as the "common garden poppy", referencing all the group of poppy plants.

Poppy seeds of Papaver somniferum are an important food item and the source of poppy seed oil, healthful edible oil that has many uses. It is widely grown as an ornamental flower throughout Europe, North America, South America, and Asia.

In 'āntrika jwara' associated with loose stools, hallucinations and sleeplessness, this medicine or its compound formulations are helpful. It is indicated in 'madātyaya' and 'unmāda' roga.

The pain during menstrual periods and the pain after bone fracture will be cured by this medicine. This medicine can be judiciously used in acute āmavāta, dislocation of bones, dry cough, threatened abortion and in night sweats of rājayakṣma.

Since the intake of 'śuddha ahiphena' slows down the heart and pulse rate, it prevents the bleeding from digestive and respiratory systems. In vātaja cough associated with severe throat irritation, this medicine is found useful.

As this drug slows down the normal heart rate also, the physician should think twice before advising it to any of the patients suffering with cardiac ailments.

**Ahiphena- external use:** (R. T. 24/257-260)

The 'lepa' of 'ahiphena' is useful in curing pneumonia and peritonitis. It can be applied in any part of the body to pacify the pain. It is applied over painful eyes. In earache, its liquid drops are instilled into the ears to bring down the pain.

In toothache, pain of rheumatoid arthritis, its application as 'lepa' gives better results. In arśa roga and other diseases of anal region, the lepa of ahiphena is beneficial. It mitigates the pain in wounds and pacifies the hyperactive nerve.

**Ahiphena- contraindications:**

न वालेपु न वृद्धेपु मघुमेहप्रपीडिते । शीतपादकरायाञ्च विषूच्यां खलु नैव च ।।
न श्लैष्मिके दथा कासे प्रचुरश्लेष्मनिर्गमे । अहिफेनं वृक्कशोथे प्रयुञ्जीत न कहिचित् ।।

(R. T. 24/256-257)

Śuddha ahiphena should not be used in children, old aged and in the patients of diabetes mellitus. It is contraindicated in cases of severe 'atisāra' where the limbs of the patient are losing their warmth. It is also contraindicated in the patients suffering with productive 'kaphaja kāsa' and 'vṛkka śotha' (renal pathology).

**Ahiphena- compound formulations:**

1. Vedanāntaka rasa
2. Nidrodaya rasa
3. Sindūrabhūṣaṇa rasa
4. Harṣodaya vaṭī
5. Maṅgalodaya vaṭī
6. Vedanāntaka malahara
7. Ahiphenāsava (Tincture opium)

## 3. JAYAPĀLA

(Croton tiglium)

### Jayapāla (Croton tiglium)- general information:

Varga : Upaviṣa
Sanskrit name : Jayapāla
English name : Purging croton
Hindi and Urdu : Jamāla-goṭā
Latin name : Croton tiglium
Family : Euphorbiaceae

Jayapāla (Croton tiglium) consists of dried seed of Croton tiglium Linn. (Fam. Euphorbiaceae); a small evergreen tree, 5-7 m high, found throughout tropical India. It is also known as purging croton. It is also called Jamāla-goṭā in Hindi and Urdu. Major known chemical constituents are glyceryl crotonate, crotonic acid, crotonic resin, and the tumor-promoting phorbol esters phorbol formate, phorbol butyrate, and phorbol crotonate.

Seeds are albuminous, ovate, oblong, slightly quadrangular, convex on dorsal and somewhat flattened on ventral surface, about 12 mm in length and resemble castor seed in shape, dull cinnamon-brown, often mottled with black due to abrasion in testa, caruncle easily detatched and usually absent, hilum on ventral side less distinct than that of castor seed, raphe runs along ventral surface of seed, terminating in a dark chalaza at opposite extremity, kernel yellowish and oily, consisting of a large endosperm, enclosing papery cotyledons and a small radicle, no marked odour; kernel gives at first oily taste followed by an unpleasant acridity.

### Jayapāla- synonyms:

जयपालश्च जेपालो रेचकः सारकस्तथा । विभेदनो मलद्रावी स एव परिकीर्तितः ।। (R. T. 24/305)

Jayapāla, jepāla, recaka, sāraka, vibhedana, maladrāvī; all these are the synonymous words used for 'Croton tiglium'.

### Jayapāla- part used:

Seeds

### Jayapāla śodhana- 1st method:

जयपालस्य बीजानि नवानि तु समाहरेत् । बाह्यत्वचमपाकृत्य द्विधा खलु विभेदयेत् ।।
हरिद्वर्णा नातिदीर्घां रसनां तु परित्यजेत् । पोट्टल्यामथ विन्यस्य दोलायन्त्रे विधानतः ।।
गव्यदुग्धे प्रयत्नेन यामैकं स्वेदयेत्ततः । एवं त्रिवारं सुस्विन्नो जयपालो विशुद्ध्यति ।।

(R. T. 24/310-312)

The seeds of a well-grown fruit of 'jayapāla tree' are selected. The external covering of the seeds is removed. The testa (greenish tongue like structure inside the seed) of these selected seeds is removed and the cotyledons are tied in a poṭṭalī.

This poṭṭalī is hung in 'dolāyantra' having godugdha (cow's milk) as liquid media and subjected to swedana for three hours (one yāma). This process of swedana in 'dolāyantra' with milk as liquid media is repeated for three times. Each time fresh milk has to be taken.

After 3rd swedana procedure, when the drug is cool on its own, it is collected from the poṭṭalī and dried under hot sun. Later the dry powder obtained is triturated well and stored in suitable airtight container as 'śuddha jayapāla' for further pharmaceutical use.

**Jayapāla śodhana- 2nd method:**

त्वग्रसंज्ञाविरहितं जयपालस्य वीजकम् । वस्वंशटङ्कणोपेतं पोट्टल्यां रोधयेद् दृढम् ।।
स्वेदयेद् दोलिकायन्त्रे द्वियामं गव्यदुग्धतः । इत्थं स्वित्रस्तु जैपालः शुद्धिमायात्यनुत्तमाम् ।।

(R. T. 24/312-313)

The seeds of a well-grown fruit of 'jayapāla tree' are selected. The external covering of the seeds is removed. The testa (greenish tongue like structure inside the seed) of these selected seeds is removed and the cotyledons are tied in a poṭṭalī along with 1/8th part of 'śuddha ṭaṅkaṇa'.

This poṭṭalī is hung in 'dolāyantra' having godugdha (cow's milk) as liquid media and subjected to swedana for six hours (two yāma). When the drug is cool on its own, it is collected from the poṭṭalī and dried under hot sun. Later the dry powder obtained is triturated well and stored in suitable airtight container as 'śuddha jayapāla' for further pharmaceutical use.

**Jayapāla śodhana- 3rd method:**

जयपालं त्वग्रसज्ञारहितं पोट्टलीगतम् । दोलायन्त्रे तु यामैकं स्वेदयेद् गव्यदुग्धतः ।।
संपेष्य खल्वे मृत्नेषु खर्परेषु प्रलेपयेत् । विज्ञाय विगतस्नेहं जयपालं समाहरेत् ।।
न्यसेद्वा यत्नतो मध्ये मषीशोषकपत्रयोः । एवं तु विगतस्नेहो रेचकः शुद्धिमाप्नुयात् ।।

(R. T. 24/314-316)

The seeds of a well-grown fruit of 'jayapāla tree' are selected. The external covering of the seeds is removed. The testa (greenish tongue like structure inside the seed) of these selected seeds is removed and the cotyledons are tied in a poṭṭalī.

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This poṭṭalī is hung in 'dolāyantra' having godugdha (cow's milk) as liquid media and subjected to swedana for three hours (one yāma). When the drug is cool on its own, it is collected from the poṭṭalī, taken in a clean 'khalva yantra' and triturated to obtain the paste of the same.

This paste is thinly applied over the top of a new mud pot and left for a while. When all the oily content in the drug is lost through the pores of the new mud pot, the dry paste on the pot is scraped and collected. It is triturated well and stored in suitable airtight container as 'śuddha jayapāla' for further pharmaceutical use.

Note: The drying of the paste may also be done by placing it on a 'blotting paper' for a while. If required more than one 'blotting papers' may be used for the purpose.

**Jayapāla- dosage:**

अष्टमांशाद्रक्तिकाया रक्तिकाचरणांशिकम् । जयपालं प्रयुञ्जीत भेषजैः सह योजितम् ॥

(R. T. 24/319)

1/8th rattī to 1/4th rattī (15.6 to 31 mgs) is the general dose of 'śuddha jayapāla'. However, the dosage is finalized after thorough consideration of the all the relevant factors.

Anupāna: Cold water

**Jayapāla- properties:**

जयपालो मतस्तिक्तो विरेचनकरः परम् । जलोदरप्रशमनो नवज्वरनिवर्हणः ॥
कृमिहारी कुष्ठहरो वातश्लेष्मनिषूदनः । वान्तिकृत्पित्तजननो वृश्चिकादिविषप्रणुत् ॥

(R. T. 24/317-318)

Śuddha jayapāla possesses tikta rasa and is a strong purgative. This is used in the patients suffering with 'jalodara' (ascites) roga and navajwara. In both these cases, the purgative action of the drug will be beneficial.

It is useful in all types of intestinal worms. Through purgation, all the intestinal worms will be pushed out. It can also be used in 'kuṣṭha roga', where the vitiated pitta will be mitigated through strong purgation. It is also useful in the diseases of vāta and kapha doṣa.

When used in higher doses, this drug induces 'vamana'. It removes the vitiated pitta from the body. The paste of this drug if applied over the scorpion bitten spot, it combats the toxic influence of scorpion bite.

**Jayapāla- contraindications:**

बाले वृद्धे कृशे क्षीणे गर्भिण्याञ्च गुदामये । प्रवाहिकायां शोथे च त्वामपक्वाशयाश्रिते ।।
गुदभ्रंशे चान्त्रशोथयुते बद्धगुदोदरे। तथान्त्रच्छदशोथे च जयपालं न योजयेत्।। (R. T. 24/339-340)

Śuddha jayapāla or any of its compound formulations should not be advised in bāla (children aged below 16 yrs), vṛddha (above 70 yrs), kṛṣṇa (very thin and lean persons), kṣīṇa (weak and emaciated) and garbhiṇī (pregnant women).

It is also contraindicated in the persons suffering from anal diseases, pravāhikā roga, āmāśaya and pakwāśaya śotha, gudabhraṁśa (rectal prolapse), baddha-gudodara and in āntrakalā śotha.

**Jayapāla- compound formulations:**

1. Icchābhedī rasa
2. Jalodarāri rasa
3. Jwarāri rasa
4. Añjanabhairava rasa
5. Vṛścīkaviṣahara pralepa

### 4. DHATTŪRA

(Datura metel)

**Dattūra- general information:**

| | | |
|---|---|---|
| Varga | : | Upaviṣa |
| Sanskrit name | : | Dattūra |
| English name | : | Thorn apple, angel's trumpet, devil's trumpet and metel |
| Hindi name | : | Dhattur |
| Latin name | : | Datura stramonium |
| Family | : | Atropaceae |
| Chemical composition | : | Scopalamine, Hyosciamine, Atropine and fixed oils. |

Datura metel is a shrub-like perennial herb, commonly known as angel's trumpet, devil's trumpet and metel. Datura metel grows in the wild in all the warmer parts of the world, and is cultivated worldwide for its chemical and ornamental properties. It was first described by Linnaeus in 1753, but no botanically correct illustrations or descriptions were made until after the New World was settled. It is not possible to be sure about its original home.

The plant is an annual herb growing up to 3 ft. high. It is slightly furry, with dark violet shoots and oval to broad oval leaves that are often dark violet as well. The pleasantly-scented 6-8. flowers are immensely varied, and can be single or double. Colors range from white to cream, yellow, red, and violet. The seed capsule is covered with numerous conical humps and a few spines. It is similar to Datura inoxia, but Datura metel has almost glabrous leaves and fruits that are knobby, not spiny. Datura inoxia is pilose all over and has a spiny fruit.

**Toxicity:**

All parts of Datura plants contain dangerous levels of tropane alkaloids (highly poisonous) and may be fatal if ingested by humans or other animals, including livestock and pets. In some places, it is prohibited to buy, sell or cultivate Datura plants.

Datura metel may be toxic if ingested in a tiny quantity, symptomatically expressed as flushed skin, headaches, hallucinations, and possibly convulsions or even a coma. The principal toxic elements are tropane alkaloids. Accidentally (or intentionally) ingesting even a single leaf could lead to severe side effects.

**Dhattūra- synonyms:**

> धत्तूरं कितवोन्मत्तौ धूर्तञ्च कनकाभिधः । शठश्च कण्टकफलः कीर्तितः शिवशेखरः ।।
>
> (R. T. 24/341)

Dhattūra, kitava, unmatta, dhūrta, all names of swarṇa (gold), śaṭha, kaṇṭakaphala and śivaśekhara; all these are the synonymous words used for 'dhattūra' in classics.

**Dhattūra- part used:**

Seeds

**Dhattūra bīja śodhana- 1st method:**

> धत्तूरबीजान्यादाय पोट्टल्यां रोधयेत्ततः । स्वेदयेद्दोलिकायन्त्रे गव्यदुग्धेन यामकम् ।।
> संस्वेद्य क्षालयेदुष्णतोयेन तु ततो भिषक् । इत्थं शुद्धानि बीजानि वीतशङ्कः प्रयोजयेत् ।।
>
> (R. T. 24/345-346)

The seeds of a well-grown fruit of 'dhattūra' are selected. They are tied in a cloth like poṭṭalī. This poṭṭalī is hung in 'dolāyantra' having godugdha (cow's milk) as liquid media and subjected to 'swedana' for three hours (one yāma).

When the drug is cool on its own, it is collected from the poṭṭalī, washed in hot water. These seeds are now dried under hot sun, powdered and later stored in suitable airtight container as 'śuddha dhattūra bīja cūrṇa' for further pharmaceutical use.

**Dhattūra bīja śodhana- 2nd method:**

नवानि धूर्तबीजानि दोलिकायन्त्रयोगतः । स्वेदयेद् गव्यमूत्रेण यामैकं पोट्टलीगतम् ।।
खल्वेऽथ खलु सम्पेष्य वस्त्रपूतं तु कारयेत् । इत्थं शुद्धानि बीजानि वीतशङ्कः प्रयोजयेत् ।।

(R. T. 24/347-348)

The seeds of a well-grown fruit of 'dhattūra' are selected. They are tied in a cloth like poṭṭalī. This poṭṭalī is hung in 'dolāyantra' having gomūtra (cow's urine) as liquid media and subjected to 'swedana' for three hours (one yāma).

When the drug is cool on its own, it is collected from the poṭṭalī and dried under hot sun. Later the dry seeds are powdered and stored in suitable airtight container as 'śuddha dhattūra bīja cūrṇa' for further pharmaceutical use.

**Dhattūra- properties:**

धत्तूरः कटुकश्चोष्णस्तथा शोथनिपूदनः । कृमिघ्नः कुष्ठशमनो विशेषाज्ज्वरनाशनः ।।
परं त्वग्दोषशमनस्तथा कण्डूतिकापहः । भ्रमकृन्मोहजननः समाख्यातो भिषग्वरैः ।।

(R. T. 24/349-350)

Śuddha 'dhattūra bīja cūrṇa' possesses kaṭu rasa and uṣṇa vīrya. It cures all types of bāhya and ābhyantara śotha. It has the capacity to kill bāhya and ābhyantara kṛmi. It is useful in kuṣṭha roga (skin diseases) and especially in 'jwara'.

It is the best medicine to cure all types of skin diseases. It cures the 'itching' present as a prominent symptom in all these skin diseases. If consumed in higher dosage than advised, it causes acute giddiness and severe uneasiness.

**Dhattūra- dosage:**

आरभ्य गुञ्जापादांशाद् गुञ्जार्द्धं तु विशोधितम् । धत्तूरबीजचूर्णन्तु प्रयुञ्जीत विधानवित् ।।
गुञ्जार्द्धतः समारभ्य सार्द्धगुञ्जैकसंमितम् । चूर्णं धत्तूरपत्राणां प्रणाचार्यः प्रयोजयेत् ।।

(R. T. 24/366-367)

The general dose of;

- Śuddha dhattūra 'bīja' cūrṇa: Quarter rattī (31 mgs) to half rattī (62.5 mgs).
- Śuddha dhattūra 'patra' cūrṇa: Half rattī (62.5 mgs) to 1.5 rattī (187.5 mgs).

Anupāna: Cow's milk.

**Dhattūra- compound formulations:**

1. Kanakāsava
2. Pralāpāntaka rasa
3. Unmādagajāṅkuśa rasa
4. Granthiśotha-nivārikā varti

## 5. VIJAYĀ (BHĀṄGA)

(Cannabis sativa)

### Vijayā - general information:

Varga : Upaviṣa
Sanskrit name : Vijayā
Hindi name : Bhāṅga
English name : Indian hemp
Latin name : Cannabis sativa
Family : Cannabaceae
Kula : Bhāṅga kula

**Cannabis sativa** is an annual herbaceous plant in the Cannabaceae family. People have cultivated this herb throughout recorded history as a source of industrial fibre, seed oil, food, recreation, religious and spiritual enlightenment, and medicine. Each part of the plant is harvested differently, depending on the purpose of its use.

Its seed, chiefly used as caged-bird feed, is a valuable source of protein. The flowers (and to a lesser extent the leaves, stems, and seeds) contain psychoactive and physiologically active chemical compounds known as cannabinoids that are consumed for recreational, medicinal, and spiritual purposes.

When so used, preparations of flowers (**marijuana**) and leaves and preparations derived from resinous extract (**hashish**) are consumed by smoking, vaporizing and oral ingestion. Historically, tinctures, teas, and ointments have also been common preparations.

### Vijayā (bhāṅga)- synonyms:

भङ्गा भङ्गी मातुलानी मादिनी मातिका तथा । मातुली विजया तन्द्राकारिणी बहुवादिनी ।।

(R. T. 24/390)

Bhaṅgā, bhaṅgī, mātulānī, mādinī, mātikā, mātulī, vijayā, tandrākāriṇī and bahuvādinī; all these are the synonymous words used in the classics for the drug 'Cannabis sativa'.

### Vijayā (bhāṅga)- description:

भङ्गा तु क्षुपजातीया सर्वत्र सुलभा मता । अतः परिचयस्तस्या विस्तरान्न प्रदर्शितः ।।
दलद्रवो दलं बीजं मातुलान्या विशेषतः । प्रयुज्यते भेषजेषु कामं रसचिकित्सकैः ।।

(R. T. 24/391-392)

Vijayā (bhāṅga) is a herb (kṣupa). It is found in all parts of our country and abroad, therefore its habitat is not specified. Its leaves, leaf juice and seeds are used by physicians for therapeutic purposes. Since this drug is considered poisonous, it needs careful purification before therapeutic use.

**Vijayā (bhāṅga)- part used:**

Unpolinated infloroscence (as Gāñjā) and Tender leaves and fruits (as Bhāṅga).

**Vijayā (bhāṅga) śodhana- 1st method:**

मातुलानीं शुष्कपत्रां सलिले तु निमज्जयेत् । निष्पीड्य शुष्कां गव्याज्ये भर्जयेन्मन्दवह्निना ॥
सुभृष्टामथ विज्ञाय सत्वरं तु समाहरेत् । इत्थं विशोधितां भङ्गां सर्वत्र विनियोजयेत् ॥

(R. T. 24/393-394)

The dry leaves of 'vjayā' are collected and soaked in enough quantity of water for a while. Later the leaves are taken out and squeezed to remove the water. These leaves are now taken in a frying pan and fried well over mild fire by adding required quantity of ghee.

When properly fried, the leaves are taken down, dried under hot sun and stored in suitable airtight container as 'śuddha vijayā' for further therapeutic use.

**Vijayā (bhāṅga) śodhana- 2nd method:**

भङ्गां विशुष्कामादाय बब्बूलत्वक् कषायतः । स्वेदयेद् घटीकार्द्धं तु मध्यमानलयोगतः ॥
विज्ञाय विजयां स्विन्नां घर्मे खलु विशोषयेत् । एवं संस्वेदिता भङ्गां शुद्धिमायात्यनुत्तमाम् ॥
एव विशोधितां भङ्गां पिष्ट्वा गोदुग्धयोगतः । कामोद्दीपनयोगेषु विशेषेण नियोजयेत् ॥

(R. T. 24/395-397)

The dry leaves of 'bhāṅga' are taken in a stainless steel vessel along with enough quantity of 'babbūla kwātha'. The vessel is placed over moderate fire and the drug is subjected for swedana (cooked) for half 'ghaṭī' (24 minutes or roughly half an hour).

Later the vessel is taken out from the fire, the decoction is decanted out and the drug is dried under hot sun. The dry drug is now powdered and stored in suitable airtight container as 'śuddha bhāṅga'.

The 'bhāṅga' purified with this method is triturated with required quantity of 'godugdha' and used especially in many compound formulations meant to improve the virility of the person.

**Vijayā (bhāṅga)- dosage:**

द्विगुञ्जतः समारभ्य चतुर्गुञ्जमितां परम् । भंगां खलु प्रयुञ्जीत बलकालाद्यपेक्षया ॥ (R. T. 24/413)

Two rattī to four rattī (250 to 500 mgs) is the general dosage of 'śuddha vijaya (bhāṅga)' for internal administration. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

Aupāna: Cow's milk added with sugar or any other suitable adjuvant.

**Vijayā (bhāṅga)- properties:**

> भङ्गा तिक्ता लघुस्तीक्ष्णा ग्राहिणी कफहारिणी । दीपना पाचनी चैव पित्तला मदकारिणी ।।
>
> (R. T. 24/398)

The leaves of 'bhāṅga' possess 'tikta' rasa; 'laghu', 'tīkṣṇa' and 'grāhī' guṇa; and mitigates vitiated kapha doṣa. It is a good appetizer and digestive. It increases 'pitta doṣa' in the body and is intoxicating (madakārī).

**Vijayā (bhāṅga)- āmayika prayoga:**

> आर्द्रा विशुष्का वा भङ्गा त्वजादुग्धेन पेषिता । प्रलिप्ता पादतलयोः निद्रां जनयति द्रुतम् ।।
> भङ्गा सुश्लक्ष्णसम्पिष्टा शिलायां विमलाम्भसा । कोष्णोपनाहयोगेन कथितार्शोव्यथाहरा ।।
> धूम्रपानविधानेन भङ्गा युक्त्याथवाशिता । साक्षेपं तमकश्वासं कासं संक्रामकं हरेत् ।।
>
> (R. T. 24/414-416)

1. The dry or wet leaves of 'vijayā' are triturated with required quantity of 'goat's milk' and the paste obtained is applied daily over the soles to induce good sleep in the patients.
2. The dry or wet leaves of 'vijayā' are triturated with required quantity of 'water' and the paste obtained is heated for a while, wrapped in a clean cotton cloth and tied as 'warm poultices' over the inflamed pile masses to bring down the inflammation and pain.
3. In case of 'tamaka śwāsa' associated with convulsions, the 'dhūmapāna' done with dry powder of 'bhāṅga' provides instant relief.
4. In case of contagious severe cough associated with convulsions, the use of 'bhāṅga' for internal administration in smaller doses will comfort the patients.

**Vijayā (bhāṅga)- compound formulations:**

1. Madanodaya modaka
2. Trailokyavijaya vaṭī
3. Trailokyasammohana rasa

### 6. GUÑJĀ

(Ābrus precatorius)

**Guñjā - general information:**

Varga : Upaviṣa

Sanskrit name : Guñjā
Hindi name : Rattī
English name : Jequirity, Crab's eye, Rosary pea, John crow bead, Precatory bean, Indian licorice, Akar saga, Giddee giddee or Jumbie bead.
Latin name : Abrus precatorius
Family : Leguminoseae

Abrus precatorius, known commonly as Jequirity, Crab's eye, Rosary pea, John crow bead, Precatory bean, Indian licorice, Akar saga, Giddee giddee or Jumbie bead in different parts of the world, is a slender, perennial climber that twines around trees, shrubs, and hedges. It is a legume with long, pinnate-leafleted leaves.

The plant is best known for its seeds, which are used as beads and in percussion instruments, and which are toxic due to the presence of abrin. The plant is native to Indonesia and grows in tropical and subtropical areas of the world where it has been introduced. It has a tendency to become weedy and invasive where it has been introduced.

In traditional systems of medicine, the white variety is used to prepare oil that is claimed to be an aphrodisiac. A tea is made from the leaves and used to treat fevers, coughs and colds. Seeds are poisonous and therefore are used after purification.

**Guñjā- synonyms:**

गुञ्जा रक्ता रक्तिका च ताम्रिका कृष्णचूडिका । उच्चटा शीतपाकी च भिल्लभूषणिकारुणा ।।
चूडामणिस्ताम्रिका च शिखण्डी कृष्णला तथा । काकणन्ती च काम्भोजो सैवेह परिकीर्तिता ।।

(R. T. 24/436-437)

Guñjā, raktā, raktikā, tāmrikā, kṛṣṇacūḍikā, ucyaṭā, śītapākī, bhillabhūṣaṇikā, aruṇā, cūḍāmaṇi, tāmrikā, śikhaṇḍī, kṛṣṇālā, kākaṇāntī, kāmbojī; all these are the synonymous words used in the classics for the drug 'Abrus precatorious'.

**Guñjā- parts used:**

Leaves, roots and seeds. Only seeds are toxic and need thorough purification.

**Guñjā śodhana- necessity:**

गुञ्जावीजं वान्तिकरं तीव्ररेचनकृत्तथा । शीलितं त्वतिमात्रं तु गुञ्जावीजमशोधितम् ।।
विषूचीलक्षणाकारां करोति हि विषक्रियाम् । अतो दोषनिवृत्यर्थं गुञ्जावीजानि शोधयेत् ।।

(R. T. 24/440-441)

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If the unpurified or improperly purified seeds of ''guñjā' are eaten in excess, it causes both vomiting and loose motion leading to toxic symptoms in the body. Therefore, the seeds of 'guñjā' are to be properly purified before they are used for any of the therapeutic purposes.

### Guñjā śodhana- 1st method:

नवानि गुञ्जाबीजानि चूर्णीकृत्य प्रयत्नतः । द्विगुणीकृतवस्त्रान्तः पोट्टल्यां रोधयेत्ततः ।।
स्वेदयेद्दोलिकायन्त्रे द्वियामं गव्यदुग्धतः । इत्थं तु गुञ्जाबीजानि शुद्धिमायान्त्यनुत्तमाम् ।।
(R. T. 24/442-443)

The well-grown seeds of 'guñjā' collected and roughly pounded. They are tied in a thick cloth as 'poṭṭalī' and hung in 'dolāyantra' containing enough quantity of 'godugdha' (cow's milk) as liquid media.

The 'dolāyantra' is now placed over moderate fire and the drug is subjected for 'swedana' for two yāma (6 hours). Later when cool on its own, the drug inside the 'poṭṭalī' is collected, washed with warm water, dried under hot sun and stored in suitable airtight container as 'śuddha guñjā' for further pharmaceutical use.

### Guñjā śodhana- 2nd method:

गुञ्जाबीजं पोट्टलीस्थं दोलायन्त्रे सकाञ्जिकम् । यामैकं स्वेदनादेव शुद्धिमायात्यनुत्तमाम् ।।
(R. T. 24/444)

The well-grown seeds of 'guñjā' collected and roughly pounded. They are tied in a thick cloth as 'poṭṭalī' and hung in 'dolāyantra' containing enough quantity of 'kāñjī' as liquid media.

The 'dolāyantra' is now placed over moderate fire and the drug is subjected for 'swedana' for one yāma (3 hours). Later when cool on its own, the drug inside the 'poṭṭalī' is collected, washed with warm water, dried under hot sun and stored in suitable airtight container as 'śuddha guñjā' for further pharmaceutical use.

### Guñjā- properties:

गुञ्जाबीजं सुविमलं कामोद्दीपनमुत्तमम् । ऊरुस्तम्भहरं चैव बलसंवर्द्धनं परम् ।।
गुञ्जापत्रं शोथहरं त्वामवातप्रणाशनम् । तथैव च समाख्यातं वेदनाहरमुत्तमम् ।।
गुञ्जापलाशनिर्यासो मधुरः कटुकस्तथा । स्वरभेदप्रशमनः शोथघ्नो वेदनाहरः ।।
गुञ्जामूलं सुमधुरं कफनिःसारकं परम् । वातपित्तहरं चैव तृष्णाशोथनिवारणम् ।।
स्वरभेदप्रशमनं तथा वान्तिविनाशनम् । मूत्रकृच्छ्रप्रशमनं बलवर्णकरं परम् ।।
कासघ्नं शुक्रजननं रुच्यं विषविनाशनम् । वृष्यं व्रणापहं चैव विशेषात्परिकीर्तितम् ।।

गुञ्जामूलं विशेषेण मधुयष्टिगुणोपमम् । अत एवाधुना तत्तु तदभावे प्रयुज्यते ।।

(R. T. 24/445-451)

Seeds of 'śuddha guñjā' are known to improve the sexual ability and desire. Its judicious internal and external use will cure urusthambha roga. When consumed for long in suitable dosage, it improves the body strength.

The leaves of 'guñjā' are useful in curing the inflammation. The lepa prepared out of 'guñjā' seeds is used for application over the affected joints in āmavāta roga to reduce the inflammation and pain. It is also useful for application in all types of vātaja śūla.

The juice of 'guñjā patra' will be madhura and kaṭu. If used daily for 'kavala', it cures 'swarabheda', 'galaśotha' and other throat ailments. The roots of 'guñjā' plant will be sweet in taste. If these roots are chewed daily, the kapha will be liquefied and cures swarabheda, tṛṣṇā (thirst), galaśotha and mūtrakṛcchra roga.

Its regular use improves the physical strength and skin complexion. The roots of 'guñjā' are useful in kāsa roga. They improve the sperm count and sexual appetite. It mitigates many types of toxins within the body. Its regular use strengthens the reproductive organs.

It cures all types of wounds. The roots of 'guñjā' possess the similar properties of 'yaṣṭīmadhu'. Therefore, now a days, in absence of 'yaṣṭīmadhu', 'guñjā mūla' is used.

**Guñjā bīja- dosage:**

गुञ्जार्द्धतः समारभ्य सार्द्धगुञ्जैकसंमितम् । गुञ्जाबीजं सुविमलं प्रयुञ्जीत विधानवित् ।।

(R. T. 24/452)

Half rattī to 1.5 rattī (62.5 to 187.5 mgs) is the general dosage of 'śuddha guñjā bīja' for internal administration. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

Anupāna: Cow's milk or honey.

**Guñjā- āmayika prayoga:**

गुञ्जाबीजं शिलापिष्टं वारिणा परिलेपितम् । निहन्त्युत्पिष्टसन्धिस्थां दारुणां शोथवेदनाम् ।।
इन्द्रलुप्तं पक्षवधं तत्तदङ्गसमाश्रितम् । गृध्रसीं दारुणां चैव सुघोरमवबाहुकम् ।।
गुञ्जाबीजं शिलापिष्टं वारिणा चित्रकान्वितम् । प्रलिप्तं शमयत्येव श्वित्रकुष्ठं विशेषतः ।।

(R. T. 24/453-455)

1. The seeds of 'guñjā' are triturated with required quantity of water in a clean khalva yantra. The paste obtained is applied daily over the affected joints to reduce the local inflammation and pain.
2. The same 'guñjā bīja kalka' lepa can be applied over affected part in 'indralupta', 'pakṣāghāta', 'ghṛdrasī', 'avabāhuka' and 'vātavyādhi' for better results.
3. One part each of 'guñjā bīja' and 'citrakamūla twak' are triturated with required quantity of water in a clean khalva yantra. The paste obtained is applied daily over the affected parts in 'świtra kuṣṭha' to cure the same.

**Guñjā- compound formulations:**

1. Guñjādya taila (prathama)
2. Guñjādya taila (dwitīya)
3. Guñjājīvana rasa
4. Guñjābhadra rasa

## 7. BHALLĀTAKA

(Semecarpus anacardium)

**Bhallātaka - general information:**

| | |
|---|---|
| Varga | Upaviṣa |
| Sanskrit name | Bhallātaka |
| Hindi name | Bhilāvā |
| English name | Marking nut |
| Latin name | Semecarpus anacardium |
| Family | Anacardiaceae |
| Chemical composition | A Tarry Oil containing Anacardic Acid, Non-Volatile Alcohol (Cardol). |

Semecarpus anacardium is a native of India, found in the outer Himalayas to Coromandel Coast. It is closely related to the cashew. It is known as bhallātaka in India and was called "marking nut" by Europeans, because it was used by washermen to mark cloth and clothing before washing, as it imparted a water insoluble mark to the cloth. It is also known as ker beeja in Kannada and bibba in Marathi.

It is a deciduous tree. The nut is about 25 millimetres (1 inch) long, ovoid and smooth lustrous black. In Ayurveda, the fruit is considered a rasāyana for longevity and rejuvenation, and is processed before use, as it is toxic in nature.

**Bhallātaka- synonyms:**

भल्लातकस्तु भल्लातस्तपनोऽरुष्करोऽग्निकः । कृमिघ्नश्चैव वातारिः स एव परिकीर्तितः ।।

(R. T. 24/470)

Bhallātaka, bhallāta, tapana, aruṣkatra, all synonyms of agni such as vahni, dahanam etc; kṛmighna and vātāri; all these are the synonymous words used in the classics for the drug 'Semicarpus anacardium'.

**Bhallātaka- part used:**

Seeds

**Bhallātaka- śodhana-yogya phala:**

> भल्लातकानि पक्वानि नीरक्षिप्तानि यानि तु । निमज्जन्ति हि तान्येव ग्राह्याणीह विशुद्धये ।।
>
> (R. T. 24/472)

The well-grown seeds of 'bhallātaka' that sink in water are considered fit for the purpose of 'śodhana'. Those, which flat in water, are considered unfit for purification and are discarded.

**Bhallātaka śodhana- necessity:**

> भल्लातकस्य तु रसः स्वल्पोऽपि पतितस्त्वचि । करोति दरुणं दाहं व्रणं चैवातिदारुणम् ।।
> शोथं सञ्जनयत्याशु तीव्रदाहसमन्वितम् । मुखे निपतितो घोरं विसर्पं प्रकरोति वै ।।
> उक्तोपद्रवशान्त्यर्थं फलं भल्लातकोद्भवम् । शोधयेद्भिषजां वर्यः सावधानतया सदा ।।
>
> (R. T. 24/473-475)

If a drop of unpurified 'bhallātaka bīja taila' falls on skin, it causes severe burning sensation and wound. If oral mucosa is exposed to the 'bhallātaka bīja taila', it causes severe inflammation associated with pain and burning sensation like that of visarpa. Therefore, it is always advised to purify the drug thoroughly before it is taken for any of the therapeutic purposes.

**Bhallātaka śodhana- 1st method:**

> इष्टकाचूर्णसंयुक्तं फलं भल्लातकोद्भवम् । पोट्टलीमध्यनिहितं घर्षयेन्नातिवेगतः ।।
> ततः प्रतप्ततोयेन क्षालयेदतियत्नतः । इत्थं तैलत्वचाहीनं भल्लातं शुद्धिमाप्नुयात् ।।
>
> (R. T. 24/476-477)

The bhallātaka seed bases are carefully cut with a sharp instrument and are tied in a thick cloth like a sack along with required quantity of 'fine brick powder'. The sack is now rubbed thoroughly from outside until the brick powder is soaked with the oil from bhallātaka seeds.

Later the seeds are washed with warm water, dried under hot sun, powdered and stored in suitable airtight container as 'śuddha bhallātaka' for further pharmaceutical use.

**Bhallātaka śodhana- 2nd method:**

> भल्लातकफलानीह नारीकेलाम्बुयोगतः । स्विन्नानि दोलिकायन्त्रे शुद्धिमायान्त्यनुत्तमाम् ।।
>
> (R. T. 24/478)

dr.keshav_raj

The bhallātaka seed bases are to be cut and are taken in a cloth. A poṭṭalī is tied and hung in dolāyantra containing freshly collected tender coconut water as liquid media.

The process of swedana is carried out by placing 'dolāyantra' over mild fire for 3 hours. Later the seeds are taken out, washed with warm water and preserved for further pharmaceutical procedures.

**Bhallātaka- properties:**

> भल्लातकः कटुस्तिक्तं अत्युष्णः कृमिनाशनः । रसायनो वलकरो गुल्मार्शोग्रहणीहरः ।।
> कुष्ठामयप्रशमनः कफवातोदरापहः । विवन्धाध्मानशूलघ्नः श्वासादिगदनाशनः ।।

(R. T. 24/479-480)

The seeds of bhallātaka possess 'kaṭu' rasa, 'uṣṇa' vīrya and 'kṛmināśaka' guṇa. When consumed judiciously, it acts as a good rejuvenator and improves the physical strength. It is useful in gulma roga, arśa roga, grahaṇī roga, kuṣṭha roga, kapha-vātaja udara roga, vibandha, ādhmāna, udara-śūla and śwāsa roga.

**Bhallātaka- mātrā:**

> गुञ्जैकतः समारभ्य गुञ्जात्रितयसंमितम् । भल्लातकं प्रयुञ्जीत वलकालाद्यपेक्षया ।।

(R. T. 24/481)

One rattī to three rattī (125 to 375 mgs) is the general dosage of 'śuddha bhallātaka bīja cūrṇa' for internal administration. However, the dosage has to be finalized after thorough consideration of all the relevant factors that affect the dosage.

Anupāna: Cow's milk, butter or ghee.

**Bhallātaka- āmayika prayoga:**

> हरीतकीतिलगुडयुतं भल्लातकं समम्। निषेवितं प्लीहपाण्डुज्वरघ्नं श्वासकासनुत्।। (R. T. 24/482)

One part each of 'śuddha bhallātaka cūrṇa', 'harītakī cūrṇa', 'tila cūrṇa' and 'guḍa'; are taken in a clean khalva yantra and triturated to obtain a homogenous mixture.

This mixture is triturated thoroughly with required quantity of 'water'. When the mixture attains the desired consistency of rolling the pills, the pills of desired size (1 rattī; 125 mgs) are prepared, dried in shade and stored in airtight glass containers. One pill (125 mgs) is administered twice or thrice daily to cure plīha roga, pāṇḍu roga, jwara roga, śwāsa and kāsa roga.

**Bhallātaka- compound formulations:**

1. Bhallātaka rasāyana
2. Bhallātakāvaleha
3. Sañjīvanī vaṭī
4. Amṛtabhallātaka

## 8. KARAVĪRA

(Nerium indicum)

**Karavīra - general information:**

| | |
|---|---|
| Varga | : Upaviṣa |
| Sanskrit name | : Karavīra |
| Hindi name | : Kanera |
| English name | : Rose berry/Oleander |
| Latin name | : Nerium indicum/Nerium oleander |
| Family | : Apocynaceae |
| Chemical composition | : Alcoloids such as Neriodorin, Nerizorine, Carabin, Scopolin and Oliandrin are present in the roots barks, seeds and leaves. |

Nerium indicum/Nerium oleander is an evergreen shrub or small tree in the dogbane family Apocynaceae, toxic in all its parts. It is the only species currently classified in the genus Nerium. It is most commonly known as **oleander.** from its superficial resemblance to the unrelated olive olea, but has many other names.

It is so widely cultivated that no precise region of origin has been identified, though southwest Asia has been suggested. The ancient city of Volubilis in Morocco took its name from the old Latin name for the flower. Oleander is one of the most poisonous of commonly grown garden plants.

Nerium oleander has historically been considered a poisonous plant based on a number of its compounds that may exhibit toxicity, especially to animals, when consumed in high amounts. Among these compounds are oleandrin and oleandrigenin, known as "cardiac glycosides" which are known to have a narrow therapeutic index and can be toxic when ingested.

**Therapeutic activity:**

Historically, Nerium oleander has been reported in ancient texts and folklore for more than 1500 years. Used traditionally as a folk remedy for a wide variety of maladies and conditions, including dermatitis, abscesses, eczema, psoriasis, sores, warts, corns, ringworm, scabies, herpes, skin cancer, asthma, dysmenorrhea, epilepsy, malaria, emetics, heart tonics, and tumors.

It has been used extensively for medicinal purposes in Mediterranean and Central and Southern Asian countries, although these applications also have their basis in folk medicine and efficacy has not been documented by clinical research. Macerated leaves of oleander have been applied topically for treatment of dermatitis, loss of hair, superficial tumors and syphilis. A decoction of oleander leaves has been used for the treatment of gingivitis and as a nose drop for children.

The "cardiac glycosides", are known to increase cardiac contractility and have been traditionally used for treatment of congestive heart failure in China. In correct dosages, they are also used as anti-arrhythmic agents to control atrial fibrillation. Additionally, recent research has determined that small quantities of these glycosides are responsible for stimulating effects on the immune system in cancer patients.

Despite their potential for what could be serious side-effects, application of Nerium oleander cardiac glycosides applied intramuscularly (IM) and orally to combat cancers is now being investigated. The National Cancer Institute has defined oleandrin, one of the principal glycosides in Nerium oleander as "A lipid soluble cardiac glycoside with potential anti-neoplastic activity."

**Karavīra- synonyms:**

करवीरो हयारिश्च हयमारोऽश्वमारकः । अश्वान्तकोऽश्वहाश्वघ्नो मतश्चण्डातकस्तथा ।।
करवीरः श्वेतपीतरक्तपुष्पविभेदतः । त्रिविधस्तु समाख्यातो वैद्यविद्याविशारदैः ।।

(R. T. 24/486-487)

Karavīra, hayāri, hayamāra, aśwamāra, aśwāntaka, aśwahā, aśwaghna, caṇḍātaka; all these are the synonymous words for the drug 'Nerium indicum'. This plant will be of three varieties depending on the colour of its flowers; 1. Śweta puṣpa karavīra 2. Rakta puṣpa karavīra and 3. Pīta puṣpa karavīra.

**Karavīra- part used:**

Roots, bark, seeds and leaves.

**Karavīra- external use:**

करवीरकमूलं तु वारिणा परिपेषितम् । समाख्यातं प्रलेपेन ह्युपदंशव्रणापहम् ।।
करवीरदलद्रावो नेत्रयोर्विनियोजितः । अभिष्यन्दं जलस्रावं व्यपोहति विशेषतः ।।

(R. T. 24/491-492)

The root skin of 'karavīra' is triturated with required quantity of water and the paste obtained is applied daily over 'syphilitic wounds' to cure the same. The fresh juice of 'karavīra patra', if instilled into the eyes, cures 'netrābhiṣyanda roga'. It also cures watering of the eyes.

**Karavīrādya taila:**

> करवीरशिफाक्वाथविपक्वं तिलतैलकम् । कल्कीकृतविडङ्गाग्नियोगतो गोजलान्वितम् ।।
> करवीराद्यतैलं तु समाख्यातं भिषग्वरैः । अभ्यङ्गाद्विनिहन्त्याशु त्वग्गतान् विविधान् गदान् ।।
>
> (R. T. 24/493-494)

1. Karavīra twak kwātha- 4 parts; 2. Tila taila- 1 part; 3. Viḍaṅga kalka- 1/8th part; 4. Ciktrakamūla kalka- 1/8th part; and 5. Gomūtra- 4 parts; all these drugs are taken in specified ratios.

First 'tila taila' is taken in a clean stainless steel vessel placed over mild fire. It is added with specified ratio of 'karavīra twak kwātha' and 'gomūtra' followed by 'viḍaṅga kalka' and 'ciktrakamūla kalka'. The mixture is cooked with frequent stirring.

As soon as 'taila siddha lakṣaṇas' are attained, the vessel is taken out from fire and the oil is filtered into another clean vessel. When cool on its own, the oil is stored in suitable airtight container as 'karavīrādya taila' for further therapeutic use. This oil when used daily for abhyaṅga cures many types of skin ailments.

## 9. LĀṄGALĪ

(Gloriosa superba)

**Lāṅgalī - general information:**

Varga : Upaviṣa
Latin name : Gloriosa superba
Family : Liliaceae
Sanskrit name : Lāṅgalī
English name : Wolf's bane, glory lilly
Hindi name : Kalihārī

A "scandent plant, climbing by leaf tip tendrils. The perianth segments, which are accrescent during a thesis and become reflexed, are striking in color, yellow proximally and at margins and dark red in the median portion".

Lāṅgalī consists of dried tuberous root of Gloriosa superb Linn. (Fam. Liliaceae) a climber with leaf tendril and large, solitary or corymbose, showy flowers with perianth segments having wavy margins, greenish at first, later becoming yellow and finally scarlet or crimson coloured, and found wild throughout the tropical regions upto 2,000 m.

### Lāṅgalī- synonyms:

लाङ्गली हलिनी सीरी विशल्या कलिहारिका । अग्निजिह्वा स्वर्णपुष्पा दीप्ता नक्तेन्दुपुष्पिका ।।
विद्युज्ज्वाला वह्निशिखा लाङ्गली गर्भपातिनी । हली लाङ्गलिनी चैव समाख्याता भिषग्वरैः ।।

(R. T. 24/495-496)

Lāṅgalī, halinī, sīrī, viśālyā, kalihārikā, agnijivhā, swarṇapuṣpā, dīptā, naktendupuṣpikā, vidyujjvālā, vahniśikhā, lāṅgalī, garbhapātinī, halī and lāṅgalinī; are the different synonyms used in the classics for the drug 'Gloriosa superba'.

### Lāṅgalī- hazards of internal administration:

शुष्का वार्द्रा लाङ्गलिनी स्वल्पापि परिशीलिता । करोति दारुणं दाहं मोहातीसारविभ्रमम् ।।

(R. T. 24/499)

The tuberous roots of 'lāṅgalī' administered in smallest quantities either in wet or dry form will cause severe dāha (burning sensation), moha (delirium), atisāra (loose stools) and bhrama (giddiness).

### Lāṅgalī- properties:

लाङ्गली कटुका चोष्णा कफवातहरा सरा । अपरापातनी चैव सद्यःप्रसवकारिका ।।
शोथापहा विशेषेण मता व्रणनिवारिणी । कुष्ठकृमिप्रशमनी विशेषात्परिकीर्तिता ।।
आभ्यन्तरप्रयोगार्थं लाङ्गलीं न प्रयोजयेत् । बाह्यप्रयोगे युञ्जीत तत्तद्रोगापनुत्तये ।।

(R. T. 24/500-502)

The tuberous roots of 'lāṅgalī' possess 'kaṭu' rasa, 'uṣṇa' vīrya and are useful in vāta-kaphaja roga. Its paste is applied over the head, sole and palms of 'prasūtā' for easy expulsion of placenta. Even in delayed labour, its lepa is applied over head, sole and palms of women in labour pains to shorten the second stage of labour.

Application of its root kalka over any affected part of the body will bring down the pain and inflammation. Its compound formulations applied over the wounds will heal the same in a short period. It is useful in kuṣṭha roga and kṛmi roga. Lāṅgalī should not be used for internal administration, but can be used for external application in suitable disease conditions.

### Lāṅgalī- external use:

सुधौतं लाङ्गलीमूलं वारिणा परिपेषितम् । नाभौ योनौ प्रलिप्तं वा सद्यःप्रसवकृन्मतम् ।।
लाङ्गली वारिणा पिष्टा करपादप्रलेपिता । अपरां पातयत्याशु न सन्देहोऽत्र कश्चन ।।

लाङ्गलीमूलतोयं तु पूरितं कृमिकर्णके । निहन्त्यन्तःप्रविष्टांस्तु शतपाद्यादिकान् कृमीन् ।।
सूर्यभक्ताद्रवोपेतः सव्योषो लाङ्गलीद्रवः । विधाय वस्त्रपूतं तु योजयेत् कृमिकर्णके ।।
पातयत्यचिरादेव कृमिकीटपिपीलिकाः । तथा कर्णजलौकाञ्च तथैवान्यान् कृमीनपि ।।
कङ्कगोधावसोपेतं तुलसीलाङ्गलीद्रवैः । साधितं तैलमभ्यङ्गाद् हन्त्युन्मन्थं विशेषतः ।।

(R. T. 24/503-508)

The 'lāṅgalī mūla' is cleaned well in water and triturated in a clean khalva yantra with required quantity of water. The paste obtained is applied over the umbilical and vaginal region of women in labour pains to induce the more labour pains and ease the process of delivery. Its paste is applied over the head, sole and palms of 'prasūtā' for easy expulsion of placenta soon after delivery.

In case of 'kṛmikarṇa' the roots of 'lāṅgalī' are triturated with required quantity of water and the liquid is instilled into the ears to kill the 'kṛmi'. If any external 'kṛmi' has entered into the ears, the juice of 'lāṅgalī mūla' and 'sūryāvarta swarasa' are added with 'trikaṭu cūrṇa' and triturated. Later the mixture is filtered and the filtrate is used for administration into the ears. By doing so, the kṛmi dies and comes out with earwax. This medicine can kill even the leach like creature that has entered the ears.

'Kaṅka' (a kind of bird), godhā (bigger lizard variety) vasā, tulasī swarasa, lāṅgalī swarasa and tilataila: all these are cooked together as per 'tailapāka method'. The taila obtained is used for massage in the affected part to cure 'unmantha' roga (kaphavātaja śotha in pinna of the ear).

## 10. ARKA KṢĪRA

(Milky Exudate of 'Calotropis procera')

**Arka (Calotropis procera)- general information:**

Varga : Upaviṣa
Sanskrit name : Arka
Hindi name : Madara
English name : Calotrope, apple of sodom, sodom apple, mudar, or osheror stabragh
Latin name : Calotropis procera
Family : Apocynaceae

Calotropis procera (known by the common names calotrope, apple of sodom, sodom apple, mudar or osheror stabragh) is a species of flowering plant in the dogbane family, Apocynaceae, that is native to North Africa, Tropical Africa, Western Asia, South Asia, and Indochina. It is commonly known as apple of Sodom, a name derived from the Hebrew Tapuah Sdom. The green globes are hollow but the flesh contains a toxic milky sap that is extremely bitter and turns into a gluey coating resistant to soap.

The milky sap contains a complex mix of chemicals, some of which are steroidal heart poisons known as "cardiac aglycones". These belong to the same chemical family as similar chemicals found in foxgloves (Digitalis purpurea).

**Arka kṣīra- synonyms:**

अर्कक्षीरं रविक्षीरं सूर्यक्षीरं तथैव च । अर्कदुग्धं सूर्यदुग्धं रविदुग्धं च तन्मतम् ।। (R. T. 24/509)

Arka kṣīra, ravi kṣīra, sūrya kṣīra, arka dugdha, sūrya dugdha and ravi dugdha; all these are the synonymous words used in the classics for the milky exudate of 'Calotropis procera'.

**Arka- parts used:**

Root bark, milky exudate, flowers and leaves.

**Arka kṣīra- properties:**

अर्कक्षीरं मतं स्निग्धं तिक्तोष्णं कुष्ठगुल्मनुत् । उदरापहमत्यन्तं रेचनं वान्तिकारकम् ।।
गुदाङ्कुरप्रशमनं कृमिदन्तव्यथापहम् । क्षारकर्मकरं चैव त्वचि लिप्तं विशेषत: ।।
(R. T. 24/510-511)

Arka kṣīra possesses 'snigdha' guṇa, 'tikta' rasa and 'uṣṇa' vīrya. It is useful in kuṣṭha, visarpa and udara roga. Its internal administration induces severe purgation and vomiting.

It can be used for external application over 'pile masses' and 'kṛmi danta' to cure the pain and inflammation. When used for application over skin in concentrated form, it acts like 'kṣāra dravya' and does 'kṣaraṇa karma' of the place.

**Arka kṣīra- external use:**

सक्षौद्रे रविदुग्धे तु तूलमल्पं निषेचितम् । कृमिदन्तस्थरन्ध्रस्थं कृमिदन्तव्यथापहम् ।।
त्रिगुणक्षौद्रसंयुक्तं रविदुग्धं प्रलेपितम् । मुखक्षतं शमयति द्रुतं नास्तीह संशय: ।।
निशाशिरीषबीजाढ्यं सूर्यदुग्धं विलेपितम् । गुदाङ्कुरान् पातयति चिरोत्थानप्यसंशयम् ।।
(R. T. 24/512-514)

One part each of 'arka kṣīra' and 'honey' are taken in a clean vessel and mixed well. In it a small piece of clean cotton is dipped and soon placed over 'kṛmi danta' to cure the local pain and inflammation.

One part of 'arka kṣīra' and 3 parts of 'honey' are taken in a clean vessel and mixed well. This solution is carefully applied over the affected part in 'stomatitis' to cure the local pain, inflammation and wound.

One part of 'arka kṣīra' is added with equal quantities of 'haridrā cūrṇa' and 'śirīṣa bīja cūrṇa' and mixed well. This solution is carefully applied over the affected part in chronic 'pile masses' to cure the local pain and inflammation. Its regular application helps in dislodging of the pile masses.

### 11. SNUHĪ KṢĪRA

(Milky Exudate of 'Euphorbia neriifolia')

**Snuhī- general information:**

Varga : Upaviṣa
Sanskrit name : Snuhī
Hindi name : Thūhara
English name : Common milk hage
Latin name : Euphorbia neriifolia
Family : Euphorbiaceae

**Snuhī kṣīra- synonyms:**

स्नुहीक्षीरं सुधाक्षीरं सेहुण्डक्षीरकं तथा । स्नुहीदुग्धं सुधादुग्धं स्नुग्दुग्धं च मतन्तु तत् ।।

(R. T. 24/515)

Snuhī kṣīra, sudhā kṣīra, sehuṇḍa kṣīra, snuhī dugdha, sudhā dugdha and sehuṇḍa dugdha; all these are the synonymous words used in the classics for the milky exudate of 'Euphorbia neriifolia'.

**Snuhī kṣīra- śodhana:**

पलद्वयं सुधादुग्धं तोलकद्वयसंमिते । चिञ्चादलद्रवे वस्त्रपूते घर्मे विशोषयेत् ।। ५१६ ।।
द्रवं विशुष्कं विज्ञाय सुधादुग्धं समाहरेत् । ततः सर्वत्र योगेषु प्रयुञ्जीत भिषग्वरैः ।।

(R. T. 24/516-517)

Two pala (96 ml) of 'snuhī kṣīra' is taken along with 2 tola (24 ml) of filtered 'ciñcā patra swarasa' in a clean wide mouthed container. The vessel is placed under sun and dried. When the liquid part dries up, the dry powder obtained is stored in suitable airtight container as 'śuddha śuṣka snuhī kṣīra' for further therapeutic use.

**Snuhī- part used:**

Kṣīra (milky exudate)

**Snuhī kṣīra- properties:**

सुधादुग्धं वातहरं गुल्मोदरविनाशनम् । विषाद्ध्मानहरं चैव गुदाङ्कुरहरं परम् ।।

परं विरेचनकरं पुष्पकृत्त्वक्षिमध्यगम् । समाख्यातं विशेषेण क्षारकर्मकरं परम् ॥

(R. T. 24/518-519)

The 'śuddha snuhī kṣīra' mitigates vāta doṣa and is useful in gulma roga and udara roga. It is also useful in combating the influence of 'viṣa' over body. It is also useful in ādhmāna and in curing the chronic pile masses.

When used for internal administration, it causes strong purgation. If it comes in contact with the eyes, the eyes lose their eye sight and it does kṣāra karma when applied over the skin.

**Snuhī kṣīra- āmayika prayoga:**

सुधादुग्धं निशाकोषातकी सैन्धवसंयुतम् । गोमूत्रेण प्रलिप्तं तु पातयेद् गुदजांकुरान् ॥

(R. T. 24/520)

One part of 'arka kṣīra' is added with equal quantities of 'haridrā cūrṇa', 'kośātakī cūrṇa', 'saindhava lavaṇa cūrṇa' and 'gomūtra'. The solution obtained is applied daily over chronic 'pile masses' to cure the pain, inflammation and to dislodge them.

## VIŚEṢA DRAVYA ŚODHANA

### 1. Eraṇḍa bīja (Ricinus communis) śodhana:

एरण्डबीजं नारिकेलोदकेन स्विन्नम् । (R. T. 24/575; Ṭīkā)

The selected eraṇḍa seeds are to be tied in a cloth as poṭṭalī and subjected for swedana in dolāyantra for 3 hours (1 yāma) keeping Tender coconut water as liquid media. Later the seeds are washed with warm water, dried under sun and used for further pharmaceutical procedures.

Note: Purification for eraṇḍa seeds is not agreed and followed by everyone in the field. Therefore, this procedure remains optional.

### 2. Marīca (Piper nigrum) śodhana:

मरीचञ्चाम्लतक्रेण भावितम् । (R. T. 24/575; Ṭīkā)

The selected marīca seeds are to taken in a clean khalva yantra, they are powdered and subjected for 3 bhāvana with amla takra (sour butter milk). Later the drug mass is dried and used for further pharmaceutical procedures.

Note: Purification for marīca seeds is not agreed and followed by everyone in the field. Therefore, this procedure remains optional.

### 3. Pippalī (Piper longum) śodhana:

पिप्पली च चित्रकरसैः भाविता शुद्धयति । (R. T. 24/575; Ṭīkā)

The selected well grown pippalī fruit are to taken in a clean khalva yantra; they are powdered and subjected for 3 bhāvana with citraka rasa (juice of Plumbago zeylanika). Later the drug mass is dried and used for further pharmaceutical procedures.

Note: Purification for pippalī phala is not agreed and followed by everyone in the field. Therefore, this procedure remains optional.

### 4. Vṛddhadāru (Argyreis speciosa) śodhana:

वृद्धदारुकबीजानि दोलायन्त्रे तु यामकम् । स्विन्नानि गव्यपयसा विशुद्धयन्ति न संशयः ।।

(R. T. 24/576)

The selected vṛddhadāru seeds are to be tied in a cloth and subjected for swedana in dolāyantra for 3 hours (1 yāma) keeping godugdha (cow's milk) as liquid media. Later the seeds are washed with hot water, dried under sun and used for further pharmaceutical procedures.

Note: Purification for vṛddhadāru seeds is not agreed and followed by everyone in the field. Therefore, this procedure remains optional.

### 5. Nimbū bīja (Citrus limon) śodhana:

अपामार्गकषायेण दोलायन्त्रे तु यामकम् । स्विन्नानि निम्बूबीजानि विशुद्धयन्ति विशेषतः ।।

(R. T. 24/577)

The selected nimbū seeds are to be tied in a cloth as poṭṭalī and subjected for swedana in dolāyantra for 3 hours (1 yāma) keeping apāmārga kwātha as liquid media. Later the outer covering of the seeds is removed, dried under sun and used for further pharmaceutical procedures.

Note: Purification for nimbūka seeds is not agreed and followed by everyone in the field. So this procedure remains optional.

### 6. Citraka (Plumbago zeylanika) śodhana:

रक्तचित्रकमूलं तु चूर्णतोये निमज्जयेत् । ततो निदाघसंशुष्कं शुद्धिमायात्यनुत्तमाम् ।। (R. T. 24/575)

The roots of 'rakta citraka' roots are cut into smaller pieces and kept immersed in lime water for 24 hours. Later the roots are taken out, washed with hot warm water, dried and preserved for further pharmaceutical procedures.

Note: Purification for rakta citraka roots is not agreed and followed by everyone in the field. So this procedure remains optional.

### 7. Laśuna śodhana:

पक्वकन्दरसोनस्य गुलिका निस्तुषीकृता । पाटयित्वा च मध्यस्थं दूरीकुर्यात्तदङ्कुरम् ।।
तदुग्रगन्धनाशाय रात्रौ तक्रे विनिक्षिपेत् ।

(Śā. Saṁ. Ma. 5/8)

The well grown garlic bulbs are de-husked, the aṅkura (innermost green part; '*rasonamadhyastha harītavarṇāṅkuram*') is removed from each bulb. The bulbs are kept immersed overnight in butter milk to get them purified.

Note: Purification for laśuna doesn't necessarily mean that garlic is having any poisonous properties in it. As mentioned in the above verse it is claimed to bring down the tīkṣṇatā (sharpness) of the drug.

**Rationality behind selection of liquids/liquid media for śodhana:**

The methods of śodhana employed for purification of different viṣa dravya in the classical books of Āyurveda are the reliable procedures developed and practiced since centuries. The term viṣa has a wider meaning here in this context. Its reference ranges from any minor untoward effect of the drug because of its sharp odor and taste to its real toxic influences in the body. The term śodhana also has a broader meaning. It implies the removal of all the physical impurities, reduction or synchronization of chemical impurities in the drug and the augmentation of the drug's therapeutic efficiencies.

For śodhana of any viṣa drug, one or the other liquid media will be employed either for swedana, bhāvana, bhārjana, sthāpana, nimajjana or simple mardana. What may be the criteria behind selection of specific dravya for śodhana of a particular drug?

When we contemplate on above posed question, we wonder at sheer intelligence of the seers; they very carefully thought on the properties of the drugs and their toxic properties and chose an appropriate liquid media for its purification. The selected liquid should possess such qualities with which it brings down the toxicity of the drug when processed. These procedures might have been finalized after so many trial and errors combination methods.

Now it is our duty to think and find out the scientific rationality behind selection of liquids/liquid medias for śodhana. Some of the hypothetical points to justify the above said theory are as below;

- **Antagonism:** When two or more drugs of opposite properties are combined together and processed, they bring down the ill effects of one another; in other words, they help to harmonizing the gurvādi guṇa of one another. The tīkṣṇtā of the drugs will be reduced.

**Examples:**

In case of marīca śodhana (find above) the bhāvana dravya used is amla takra;

here the laghu-tīkṣṇa guṇa, kaṭu rasa, kaṭu vipāka and uṣṇa vīrya of marīca is counter-acted by the exactly opposite properties of amla takra which possesses amla-madhura rasa and śīta vīrya.

- **Synergism:** When two or more drugs of similar properties are combined together and processed, they augment the activity of one another to produce an effect, which would not have been possible for any of the involved drugs individually. In this context whenever any dravya or set of dravya are selected for particular drug purification this concept is kept in mind.

**Example:**

In case of pippalī śodhana (find above) the bhāvanā dravya used is citraka swarasa; here the laghu-tīkṣṇa guṇa, kaṭu rasa, and anuṣṇa vīrya of pippalī is augmented by properties of citraka swarasa which also possesses kaṭu rasa, laghu-tīkṣṇa guṇa and uṣṇa vīrya.

- Liquid media contributes in getting rid of the any disagreeable taste and unpleasant odor of the drug.

**Examples:**

In case of hiṅgu śodhana (find above), goghṛta (ghee) is used for the purpose of bhārjana; here the madhura rasa, guru-śīta guṇa, and madhura vīrya of goghṛta counteracts the properties of hiṅgu which possesses kaṭu rasa, tīkṣṇa guṇa and uṣṇa vīrya; thus it removes the disagreeable taste and unpleasant odor of hiṅgu.

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## Chapter 25
## AUṢADHA YOGA
## (Compound Formulations)

### (I) KHALVĪYA RASĀYANA

### 1. Agnituṇḍī vaṭī:

शुद्धसूतं विषं गन्धमजमोदां फलत्रयम् । स्वर्जिक्षारं यवक्षारं वह्निसैन्धवजीरकम् ।।
सौवर्चलं विडङ्गानि सामुद्रं टङ्कणं समम् । विषमुष्टिं सर्वतुल्यं जम्बीराम्लेन मर्दयेत् ।
मरिचाभां वटीं खादेदग्निमान्द्यप्रशान्तये ।।

(B.R. Agnimāndyādirogādhikāra 10/93-94)

Ingredients:

| | | | |
|---|---|---|---|
| 1. Śuddha pārada | : 1 part | 12. Śweta jīraka | : 1 part |
| 2. Śuddha vatsanābha | : 1 part | 13. Sauvarca lavaṇa | : 1 part |
| 3. Śuddha gandhaka | : 1 part | 14. Viḍaṅga | : 1 part |
| 4. Ajamoda | : 1 part | 15. Samudra lavaṇa | : 1 part |
| 5. Harītakī | : 1 part | 16. Śuddha ṭaṅkaṇa | : 1 part |
| 6. Vibhītakī | : 1 part | 17. Śuddha kupīlu | : 16 parts |
| 7. Āmalakī | : 1 part | (equal to all other drugs) | |
| 8. Sarja kṣāra | : 1 part | • Bhāvanā dravya | : Jambīra nimbū swarasa; |
| 9. Yava kṣāra | : 1 part | | |
| 10. Citraka | : 1 part | | |
| 11. Saindhava lavaṇa | : 1 part | | |

Method of preparation:

Śuddha pārada and śuddha gandhaka are taken in a clean khalva yantra and triturated thoroughly to obtain appropriate kajjalī. To it the fine powders of remaining ingredients are added one by one and homogenously mixed.

This mixture is now subjected to one bhāvanā with 'jambīra nimbū swarasa' to roll the pills of 1 marīca size (125 mg). The pills are dried in shade and stored in airtight glass containers for further therapeutic use. The pills will be blackish in color with tikta rasa and rasāyana gandha.

Dosage, adjuvant and therapeutic utility:

One pill (125 mgs) is administered twice or thrice daily along with nimbū swarasa or uṣṇajala. It is indicated in all types of agnimāndya.

Note: The size of marīca (fruit of Piper nigrum) cannot be the standard criteria for dose selection. So a dose for this formulation is roughly taken as 125 mgs. For instance Zandu Pharmaceutical Company markets this formulation in blister packs, containing tablets of 65 mgs and in practice two to three such tablets are advised.

### 2. Ānandabhairava rasa:

हिङ्गुलञ्च विषं व्योषं टङ्कणं गन्धकं समम् । जम्बीररससंयुक्तं मर्दयेद्यामकद्वयम् ।
कासश्वासातिसारेषु ग्रहण्यां सान्निपातिके । अपस्मारेऽनिले मेहेऽप्यजीर्णे वह्निमान्द्यके ।
गुञ्जामात्रः प्रदातव्यो रस आनन्दभैरवः ।।

(B.R. Jwarātisārādhikāra 6/86-87)

Ingredients:

| | |
|---|---|
| 1. Śuddha hiṅgula | : 1 part |
| 2. Śuddha vatsanābha | : 1 part |
| 3. Trikaṭu | : 1 part |
| 4. Śuddha ṭankaṇa | : 1 part |
| 5. Śuddha gandhaka | : 1 part |

Method of preparation:

Śuddha hiṅgula and śuddha gandhaka are taken in a clean khalva yantra and triturated. To it the fine powders of remaining ingredients are added one by one and homogenously mixed.

This mixture is subjected to one bhāvanā with 'jambīra nimbū swarasa' for 2 prahara (6 hours), to roll the pills of 1 rattī size. The pills are dried in shade and stored in airtight glass containers for further therapeutic use. The pills will be blackish in color with kaṭu rasa and rasāyana gandha.

Dosage, adjuvant and therapeutic utility:

One pill (125 mg) is administered once or twice daily along with any suitable adjuvant. It is useful in jwarātisāra, atisāra, grahaṇī, ajīrṇa and agnimāndya.

### 3. Ārogyavardhanī rasa:

रसगन्धकलोहाभ्रशुल्वभस्मसमांशकम् । त्रिफला द्विगुणा प्रोक्ता त्रिगुणञ्च शिलाजतु ।।
चतुर्गुणं पुरं शुद्धं चित्रमूलं च तत्समम् । तिक्ता सर्वं समा ज्ञेया सर्वं सञ्चूर्ण्य यत्नतः ।।
निम्बवृक्षदलाम्भोभिर्मर्दयेद्द्विदिनावधि । ततश्च वटिका कार्या राजकोलफलोपमा ।।
मण्डलं सेविता सैषा हन्ति कुष्टान्यशेषतः । वातपित्तकफोद्भूताञ्ज्वरान्नानाप्रकारजान् ।।
देया पञ्चदिने जाते ज्वरे रोगे वटी शुभा । पाचनी दीपनी पथ्या हृद्या मेदोविनाशिनी ।।
मलशुद्धिकरी नित्यं दुर्धर्षक्षुत्प्रवर्तिनी । बहुनाम किमुक्तेन सर्वरोगेषु शस्यते ।।
आरोग्यवर्धनी नाम्ना गुटिकेयं प्रकीर्तिता । सर्वरोगप्रशमनी श्रीनागार्जुनयोगिना ।।

(B. R. Kuṣṭharogādhikāra 54/111-117)

dr keshav raj

Ingredients:

1. Śuddha pārada : 1 part
2. Śuddha gandhaka: 1 part
3. Loha bhasma : 1 part
4. Abhraka bhasma : 1 part
5. Tāmra bhasma : 1 part
6. Triphalā : 2 parts each
7. Śuddha śilājatu : 3 parts
8. Śuddha guggulu : 4 parts
9. Citraka mūla : 4 parts
10. Tiktā (kaṭukī) : 18 parts

- Bhāvanā dravya : Nimba-vṛkṣa dala rasa (juice of neem leaves)

Method of preparation:

Taking śuddha pārada and śuddha gandhaka in a clean khalva yantra, appropriate kajjalī is prepared. To it, all the remaining ingredients (except śuddha guggulu and śuddha śilājatu) are added and the trituration is continued to obtain a homogenous mixture.

Meanwhile śuddha guggulu and śuddha śilājatu are taken in a stainless steel vessel along with required quantity of water. When both these drugs completely melt, the blend is added to the khalva yantra containing the homogenous drug mixture of all other drugs.

The mixture is now triturated with 'nimba vṛkṣa dala rasa' for two days to roll the pills of 1 rājakola (badara phala of bigger variety; roughly 6 gms) (see the comment below). The pills are dried in shade and stored in airtight containers for further therapeutic use. The pills will be blackish in colour with tikta rasa and rasāyana gandha.

Dosage, adjuvant and therapeutic utility:

One pill (6 gms) is administered once or twice daily along with honey or any decoction prepared from kuṣṭhaghna dravya. It is indicated in maṇḍala kuṣṭha and all other 18 types of kuṣṭha roga. It is also useful in vātaja-pittaja-kaphaja-dwandwaja-sannipātaja jwara. This medicine is administered from 5th day of fever onset.

This medicine is a good digestive, appetizer, health promoter, cardio-tonic and brings down 'meda dhātu'. It acts as mild laxative and does deha-śuddhi. With different adjuvants this medicine can be effectively used in all the disease conditions. This medicine was formulated by Ācārya Nāgārjuna.

Note: The dosage mentioned in the verse is 'rājakola-phala' (bigger variety of badara phala), which is considered roughly half tolā (6 gms). Author of 'Rasayoga Sāgara' (Pandit Hariprapanna Sharma) mentions it as 'kṣudrakola-phala' (badara phala smaller variety) which will be roughly of 1 gram.

dr.keshav raj

Now-a-days, the machine made tablets of 500 mgs are prepared and marketed by almost every company in the market. This medicine is quite extensively prescribed by Āyurvedic physicians. The original reference of this formulation is Rasaratnasamuccaya 20/87-93.

**4. Ayaskṛti:**

Ayaskṛti has three major references quoted below:

(A) Lauhādi rasāyana in Caraka Saṁhitā, Cikitsā Sthāna 1:3/15-23; Rasāyanādhyāya 3rd pāda.

(B) Auṣadha ayaskṛti and Mahā auṣadha ayaskṛti in Suśruta Saṁhitā, Cikitsā Sthāna 10/ 11; for Mahākuṣṭha-cikitsā.

(C) Ayaskṛti in Aṣṭāṅga Hṛdaya, Cikitsā Sthāna 12/28-32; for Prameha cikitsā.

**(A) Lauhādi rasāyana:**

त्रिफलाया रसे मूत्रे गवां क्षारे च लावणे । क्रमेण चेङ्गुदीक्षारे किंशुकक्षार एव च ।
तीक्ष्णायसस्य पत्राणि वन्हिवर्णानि साधयेत् । चतुरङ्गुलदीर्घाणि तिलोत्सेधतनूनि च ।।
ज्ञात्वा तान्यञ्जनाभानि सूक्ष्मचूर्णानि कारयेत् । तानि चूर्णानि मधुना रसेनामलकस्य च ।
युक्तानि लेहवत् कुम्भे स्थितानि घृतभाविते । संवत्सरं निधेयानि यवपल्ले तथैव च ।।
दद्यादालोडनं मासे सर्वत्रालोडयन् वुधः । संवत्सरात्यये तस्य प्रयोगो मधुसर्पिषा ।।
प्रातः प्रातर्वलापेक्षी सात्म्यं जीर्णे च भोजनम् । एप एव च लौहानां प्रयोगः संप्रकीर्तितः ।।
नाभिघातैर्न चातङ्कैर्जरया न च मृत्युना । स धृष्यः स्याद्गजप्राणः सदा चातिबलेन्द्रियः ।।
धीमान् यशस्वी वाक्सिद्धः श्रुतधारी महाधनः । भवेत् समां प्रयुञ्जानो नारो लौहरसायनम् ।।
अनेनैव विधानेन हेम्नश्च रजतस्य च । आयुः प्रकर्षकृत्सिद्धः प्रयोगः सर्वरोगनुत् ।।

( Ca. Ci. 1: 1/15-23; Rasāyanādhyāya 3rd pāda)

Method of preparation:

Tīkṣna lauha has to be chiseled to get it in thin pieces of four aṅgula in length and thickness of sesame seed. (3rd and 4th line)

These leaves are heated red hot and dipped several times into triphalā kvātha, gomūtra, alkaline water of lavaṇa, iṅgudī kṣāra and kiṁśuka (palāśa) kṣāra respectively. When the leaves turn deep red color like añjana, its sūkṣma cūrṇa is prepared in khalva yantra. (1st, 2nd and 5th line)

This powder is mixed with honey and āmalakī rasa and mixed well to get it in lehyavat form. This mixture is poured into an earthen pot smeared with ghee from inside. (5th, 6th and 7th line)

This pot is placed inside the heap of yava and left for one year. Every month the mixture is mixed thoroughly and sealed again. (8th and 9th line)

At the end of the year the pot is opened and the product inside is administered in the morning time with required quantity of honey and ghee depending on the agnibala of the person. Usually the dosage of tīkṣṇa lauha is half to 2 rattī (62.5 mg to 250 mg). After digestion of this medicine person is asked to take normal food. ($10^{th}$, 11th and 12th line)

Proper use of this makes the person live longer with no fear of diseases. Old age and death are delayed. Man's prāṇa becomes strong like that of elephant's; his sense organs remain sharp for long. He turns valorous, attains vāk-siddhi and becomes quick learner and rich. (13th to 16th line)

With the same method gold and silver metals can also be processed. Use of these give prolonged healthy life and rescue the person from all diseases. (17th and 18th line)

**(B) Auṣadha ayaskṛti and mahā auṣadha ayaskṛti:**

(Suśruta Saṁhitā, Cikitsā Sthāna 10/ 11; for Mahākuṣṭhacikitsā)

तीक्ष्णलोहपत्राणि तनूनि लवणवर्गप्रदिग्धानि गोमयाग्निप्रतप्तानि त्रिफलाशालसारादिकषायेण निर्वापयेत् षोडशवारान्, ततः खदिराङ्गारतप्तान्युपशान्ततापानि सूक्ष्मचूर्णानि कारयेद्घनतान्तवपरिस्रावितानि, ततो यथाबलं मात्रां सर्पिर्मधुभ्यां संसृज्योपयुंजीत, जीर्णे यथाव्याध्यनम्लं लवणं आहारं कुर्वीत, एवं तुलामुपयुज्य कुष्टमेहमेदःश्वयथुपाण्डुरोगो उन्माद अपस्मार अनुपहत्य, वर्षशतं जीवति, तुलायां तुलायां वर्षशतमुत्कर्षः, एतेन सर्वलौहेषु अयस्कृतयो व्याख्याताः ॥ (S. S. Ci. 10/11)

Method of preparation:

The thin sheet of tīkṣṇa lauha are smeared with solution of pañca lavaṇa and heated red hot in the heat produced by dry cow dung cakes. It is later dipped in triphalā kvātha śālasārādi gaṇa dravya kaṣāya for 16 times.

Later it is heated in fire produced by khadira wood and left there until the fire fades off on its own. Later it is collected and finely powdered in khalva yantra.

This powder is administered along with ghee and honey in required quantity. During drug administration pathya āhāra has to be taken by the person. The dosage has to be started from 5 guñjā to 1 māṣa (625 mg to 750 mg) according to commentators.

As per author if the drug is administered in this fashion up to quantity of one tulā it cures kuṣṭha, prameha, medoroga, śvayathu, pāṇḍu, unmāda, apasmāra and lives a healthy life for 100 years. He also mentions that with another course of this drug administration in the same quantity increases the life span of the person for another 100 years.

The above explanation is only intended to speak about the significance of the preparation. With its proper administration the person may have a healthy and long life span.

This preparation may be performed with all the other metals.

**(C) Ayaskṛti:**

> साधयेद् असनादीनां पलानां विंशतिं पृथक् । द्विवहेऽपांक्षिपेत्तत्र पादस्थे द्वे शते गुडात् ।।
> क्षौद्राढकार्धं पलिकं वत्सकादिं च कल्कितम् । तत् क्षौद्रं पिप्पली चूर्णप्रदिग्धे घृतभाजने ।
> स्थितं द्रृढे जतुसृते यवराशौ निधापयेत् । खदिराङ्गार तप्तानि बहुशोऽत्र निमज्जयेत् ।
> तनूनि तीक्ष्णलोहस्य पत्राण्यालोहसङ्क्षयात् । अयस्कृतिःस्थिता पीता पूर्वस्मादधिका गुणैः ।।
> रुक्षमुद्वर्तनं गाढं व्यायामो निशी जागरः । (A. H. Ci. 12/28-32; Prameha cikitsā)

Ingredients:

| | |
|---|---|
| 1. Asanādi gaṇa dravya | each 20 pala |
| 2. Jala (water) | 2 vaha (droṇa) |
| 3. Guḍa | 200 pala |
| 4. Madhu | Half āḍhaka |
| 5. Vatsakādi gaṇa dravya | each 1 pala |

Method of preparation:

The coarse powder of asanādi gaṇa dravya is prepared. It is added with prescribed quantity of water. The mixture is boiled over mild fire and reduced to 1/4th. The liquid is later filtered. Before the filtrate turns fully cool, it is added with the mentioned quantity of jaggary and dissolved by continuous stirring.

After dissolution of guda the mixture may be filtered once and is poured into a mud pot which is dhūpita (fumigated) and smeared inside with ghee, honey and pippalī cūrṇa. The remaining drugs, madhu and vatsakādi gaṇa dravya cūrna are added to the pot and stirred carefully without damaging the pot.

Now the pot is given a thick coat of jatu (lac) from outside and placed in the heap of yava.

The thin sheets of tīkṣṇa lauha (magnetic iron) are made red hot with agni of khadira wood and dipped into the liquid inside the pot. This process is repeated several times until whole of the iron gets depleted in the liquid media.

The mouth of the pot is now sealed and placed undisturbed for a fortnight.

This formulation is known as ayaskṛti. Author says that if this formulation is consumed daily it serves better than the formulation explained earlier to this (rodhrāsava explained earlier to ayaskṛti).

Note: Though ayaskṛti procedure of mineral drug administration seems outdated now, it has initiated the thought about better administration of metallic products.

With the evolution of māraṇa procedure to many of the metallic drugs, the older ayaskṛti method was less practiced.

Currently we have incineration methods for all the metals fully developed wherein the metallic elements are processed and made absorbable by living body tissue.

Compared to the new method of drug incineration the older ayaskṛti method is long and tiresome. Moreover the absorbability of the ayaskṛti dhātu cūrṇa cannot be substantiated on parameters available now.

But scope for further research in the aspects of ayaskṛti as well as māraṇa cannot be denied.

**5. Bṛhat vāta cintāmaṇi rasa:**

भागत्रयं स्वर्णभस्म द्विभागं रौप्यमभ्रकम् । लौहात् पञ्च प्रवालञ्च मौक्तिकं त्रयसम्मितम् ।।
भस्मसूतं सप्तकञ्च कन्यारसविमर्दितम् । वल्लमात्रा वटी कार्या भिषग्भि: परियत्नत: ।।
यथाव्याध्यनुपानेन नाशयेद्रोगसङ्कुलम् । वातरोगं पित्तकृतं निहन्ति नात्रचिन्तनम् ।।
वृद्धोऽपि तरुणस्पर्द्धी कन्दर्पसमविक्रम: । दृष्ट: सिद्धफलश्चायं वातचिन्तामणिस्त्विह ।।

(B. R. Vātavyādhirogādhikāra 26/141-144)

Ingredients:

| | |
|---|---|
| 1. Swarṇa bhasma | : 3 parts (30 gms) |
| 2. Rajata bhasma | : 2 parts (10 gms) |
| 3. Abhraka bhasma | : 2 parts (10 gms) |
| 4. Loha bhasma | : 5 parts (50 gms) |
| 5. Pravāla bhasma | : 3 parts (30 gms) |
| 6. Mauktika bhasma | : 3 parts (30 gms) |
| 7. Rasasindūra | : 7 parts (70 gms) |
| • Bhāvanā dravya | : Ghṛtakumārī swarasa |

Method of preparation:

Rasasindūra is taken in a clean khalva yantra and triturated for a while. Later it is added with all the remaining ingredients and triturated further to obtain a homogenous mixture.

This mixture is now subjected to 1 bhāvanā with 'ghṛtakumārī swarasa' to roll the pills of 1 valla (3 rattī; 375 mgs). The pills are dried in shade and stored in airtight glass containers. The pills will be reddish in colour with tikta rasa and rasāyana gandha.

Dosage, adjuvant and therapeutic utility:

One pill (1 valla; 3 rattī; 375 mgs) is administered once or twice daily along with honey or any other suitable adjuvant. It is useful in all diseases of vāta and pitta doṣa. Its regular use induces the virility of a strong adult (like that of Kandarpa or Kāmadeva) in an old man.

### 6. Candanādi lauha:

> रक्तचन्दनह्रीबेरपाठोशीरकणशिवानागरोत्पलधात्रीभिस्त्रिमदेन समन्वितः ।
> लौहो निहन्ति विविधान् समस्तान् विषमज्वरान् ॥

(Rasendrasārasaṅgraha; Jwara cikitsā 220)

Ingredients:

| | |
|---|---|
| 1. Raktacandana cūrṇa | : 1 part |
| 2. Hrībera cūrṇa | : 1 part |
| 3. Pāṭhā cūrṇa | : 1 part |
| 4. Uśīra cūrṇa | : 1 part |
| 5. Pippalī cūrṇa | : 1 part |
| 6. Harītakī (śivā) cūrṇ | : 1 part |
| 7. Śuṇṭhī (nāgara) cūrṇa | : 1 part |
| 8. Utpala cūrṇa (kamala puṣpa) | : 1 part |
| 9. Āmalakī cūrṇa | : 1 part |
| 10. Mustā cūrṇa | : 1 part |
| 11. Citraka cūrṇa | : 1 part |
| 12. Viḍaṅga cūrṇa | : 1 part |
| 13. Loha bhasma | : 12 parts |

Method of preparation:

The fine powders of the drugs from 1 to 12 are taken in clean khalva yantra and triturated to obtain a homogenous mixture. It is now added with equal quantity of loha bhasma and mixed well.

The mixture is stored in suitable airtight glass container as 'Candanādi lauha' for further therapeutic use. The medicine will be of ash color with kaṭu rasa and characteristic odor.

Dosage, adjuvant and therapeutic utility:

Two to four rattī (250 to 500 mgs) is administered once or twice daily along with suitable adjuvant to cure all types of viṣamajwara.

### 7. Candrāmṛta rasa:

> रसगन्धकयोर्ग्राह्यं कर्षमेकं सुशोधितम् । अभ्रं निश्चन्द्रकं दद्यात् पलार्द्धञ्च विचक्षणः ॥
> कर्पूरं शाणकं दद्यात् स्वर्ण तोलकसम्मितम् । ताम्रञ्च तोलकं दद्यात् विशुद्धं मारितं भिषक् ॥
> लौहं कर्षं क्षिपेत्तत्र वृद्धदारकजीरकम् । विदारी शतमूली च क्षुरकञ्च बला तथा ॥
> मर्कटयतिबला चैव जातीकोषफले तथा । लवङ्गं विजयाबीजं श्वेतसर्जरसं तथा ॥
> शाणभागं समादाय चैकीकृत्य प्रयत्नतः । मधुना मर्दयेत्तावद् यावदेकत्वमागतम् ॥

चतुर्गुञ्जाप्रमाणेन वटिकां कुरु यत्नतः । भक्षयेद्वटिकामेकां पिप्पलीमधुना सह ।।

(B. R. Rājayakṣmādhikāra 14/111-116)

Ingredients:

| | |
|---|---|
| 1. Śuddha pārada | : 1 karṣa (12 gms) |
| 2. Śuddha gandhaka | : 1 karṣa (12 gms) |
| 3. Abhraka bhasma | : half pala (24 gms) |
| 4. Karpūra | : 1 śāṇa (3 gms) |
| 5. Suvarṇa bhasma | : 1 karṣa (12 gms) |
| 6. Tāmra bhasma | : 1 karṣa (12 gms) |
| 7. Loha bhasma | : 1 karṣa (12 gms) |
| 8. Vṛddhadāru cūrṇa | : 1 śāṇa (3 gms) |
| 9. Jīraka cūrṇa | : 1 śāṇa (3 gms) |
| 10. Vidārī chūrṇa | : 1 śāṇa (3 gms) |
| 11. Śatāvarī cūrṇa | : 1 śāṇa (3 gms) |
| 12. Gokṣura cūrṇa | : 1 śāṇa (3 gms) |
| 13. Balāmūla cūrṇa | : 1 śāṇa (3 gms) |
| 14. Atibalā cūrṇa | : 1 śāṇa (3 gms) |
| 15. Markata cūrṇa | : 1 śāṇa (3 gms) |
| 16. Atibalā cūrṇa | : 1 śāṇa (3 gms) |
| 17. Jātīphala cūrṇa | : 1 śāṇa (3 gms) |
| 18. Lavaṅga cūrṇa | : 1 śāṇa (3 gms) |
| 19. Vijayābīja cūrṇa | : 1 śāṇa (3 gms) |
| 20. Sarjarasa | : 1 śāṇa (3 gms) |

- Bhāvanā dravya : Madhu (honey)

Method of preparation:

Taking śuddha pārada and śuddha gandhaka in a clean khalva yantra appropriate kajjalī has to be prepared. To it all the remaining bhasma are added and triturated. Later the fine powder of all the remaining herbal drugs are added one by one and triturated to obtain a homogenous mixture.

This mixture is subjected for one bhāvanā with madhu to roll the pills of 4 rattī (500 mgs). The pills are dried in shade and stored in airtight containers. The pills will be of ash colour with madhura rasa and karpūra gandha.

Dosage, adjuvant and therapeutic utility:

One pill (500 mgs) is administered daily once or twice along with 'pippalī cūrṇa' and 'madhu' to cure 'rājayakṣma roga' and 'kāsa roga'.

### 8. Candraprabhā vaṭī - 2:

चन्द्रप्रभा वचा मुस्तं भूनिम्ब अमृतदारूकम् । हरिद्रा अतिविषा दार्वी पिप्पलीमूल चित्रकौ ।।
धान्यकं त्रिफला चव्यं विडङ्ग गजपिप्पली । व्योषं माक्षिकधातुश्च द्वौ क्षारौ लवणत्रयम् ।।
एतानि शाणमात्राणि प्रत्येकं कारयेद्बुधः । त्रिवृद्दन्तीपत्रकं च त्वगेला वंशरोचना ।।
प्रत्येकं कर्षमात्राणि च कुर्याद् एतानि बुद्धिमान् । द्विकर्ष हतलोहं स्याच्चतुष्कर्षा सिता भवेत् ।।
शिलाजत्व अष्टकर्ष स्यादष्टौ कर्षाश्च गुग्गुलोः । एभिरेकत्र संक्षुण्णैः कर्तव्या गुटिका शुभा ।।

dr. keshav raj

चण्द्रप्रभेति विख्याता सर्वरोगप्रणाशिनी । प्रमेहान्विंशतिं कृच्छ्रं मूत्राघातं तथाश्मरीम् ।।
विबन्धाऽऽनाहशूलानि मेहनं ग्रन्थिमर्बुदम् । अन्त्रवृद्धिं कटीशूलं श्वासं कासं विचर्चिकाम् ।।
अण्डवृद्धिं तथा पाण्डुं कामलां च हलीमकम् । कुष्ठान्यर्शांसि कण्डूं च प्लीहोदरभगन्दरम् ।।
दन्तरोगं नेत्ररोगं स्त्रीणां आर्तवजां रुजम् । पुंसां शुक्रगतान्दोषान् मन्दाग्निं अरुचिं तथा ।।
वायुं पित्तं कफं हन्याद् बल्या वृष्या रसायनी । चन्द्रप्रभायां कर्षस्तु चतुःशाणो विधीयते ।।
(Śā. Ma. 7/40-44)

Ingredients:

1. Candraprabhā (karpūra) : 1 karṣa (12 gms)
2. Vacā cūrṇa : 1 karṣa (12 gms)
3. Mustā cūrṇa : 1 karṣa (12 gms)
4. Bhūnimba cūrṇa : 1 karṣa (12 gms)
5. Amṛtā cūrṇa : 1 karṣa (12 gms)
6. Devadāru cūrṇa : 1 karṣa (12 gms)
7. Haridrā cūrṇa : 1 karṣa (12 gms)
8. Ativiṣā cūrṇa : 1 karṣa (12 gms)
9. Dāruharidrā cūrṇa : 1 karṣa (12 gms)
10. Pippalīmūla cūrṇa : 1 karṣa (12 gms)
11. Citrakamūla cūrṇa : 1 karṣa (12 gms)
12. Trivṛt cūrṇa : 1 karṣa (12 gms)
13. Dantīmūla cūrṇa : 1 karṣa (12 gms)
14. Tejapatra cūrṇa : 1 karṣa (12 gms)
15. Twak cūrṇa : 1 karṣa (12 gms)
16. Sūkṣma elā cūrṇa : 1 karṣa (12 gms)
17. Vaṁśalocana cūrṇa : 1 karṣa (12 gms)
18. Dhānyaka cūrṇa : 1 ṭaṅka (3 gms)
19. Harītakī cūrṇa : 1 ṭaṅka (3 gms)
20. Bibhītakī cūrṇa : 1 ṭaṅka (3 gms)
21. Āmalakī cūrṇa : 1 ṭaṅka (3 gms)
22. Cavya cūrṇa : 1 ṭaṅka (3 gms)
23. Viḍaṅga cūrṇa : 1 ṭaṅka (3 gms)
24. Gajapippalī cūrṇa : 1 ṭaṅka (3 gms)
25. Swarṇa mākṣika bhasma cūrṇa : 1 ṭaṅka (3 gms)
26. Śuṇṭhī cūrṇa : 1 ṭaṅka (3 gms)
27. Marīca cūrṇa : 1 ṭaṅka (3 gms)
28. Pippalī cūrṇa : 1 ṭaṅka (3 gms)
29. Yavakṣāra cūrṇa : 1 ṭaṅka (3 gms)
30. Sarja kṣāra cūrṇa : 1 ṭaṅka (3 gms)

| | |
|---|---|
| 31. Saindhava lavaṇa cūrṇa | : 1 ṭaṅka (3 gms) |
| 32. Sauvarca lavaṇa cūrṇa | : 1 ṭaṅka (3 gms) |
| 33. Viḍa lavaṇa cūrṇa | : 1 ṭaṅka (3 gms) |
| 34. Loha bhasma | : 2 karṣa (24 gms) |
| 35. Sugar | : 4 karṣa (48 gms) |
| 36. Śuddha śilājatu | : 8 karṣa (96 gms) |
| 37. Śuddha guggulu | : 8 karṣa (96 gms) |

Method of preparation:

Fine powders of all the herbal and mineral ingredients (śuddha śilājatu and śuddha guggulu) are taken in a clean khalva yantra and triturated to obtain a homogenous mixture.

Now śuddha śilājatu and śuddha guggulu are taken in a clean stainless steel vessel placed over mild fire along with required quantity of water. The mixture is boiled with frequent stirring. When both the drugs completely melt, the diluted water is added to the homogenous drug mixture in khalva yantra and triturated. Little quantity of water may be sprinkled and the trituration is continued until the drug mass attains the desired consistency of rolling the pills.

From this drug mass, the pills of 4 rattī (500 mgs) are rolled, dried in shade and preserved in air tight containers. The pills will be of ash colour with tikta rasa and śilājatu gandha.

Dosage, adjuvant and therapeutic utility:

One pill (1 gram) is administered twice or thrice daily along with honey and ghee in unequal ratio followed by intake of takra, mastu, ghṛta and madhu.

It is indicated especially in 20 types of prameha and also in mūtrakṛcchra, mūtrāghāta, aśmarī, vibandha, ānāha, śūla, granthi, arbuda, āntravṛddhi, kaṭiśūla, śwāsa, kāsa, vicarcikā, aṇḍavṛddhi, pāṇḍu, kāmalā, halīmaka, kuṣṭha, arśa roga, kaṇḍu, plīha roga, udara roga, bhagandhara, dantaroga, netraroga and in diseases of ārtava and śukra. It is also balya (strengthening) and rasāyana (rejuvenator).

Note:

The term candraprabhā is attributed with different meanings in classics.

- Śrī Āḍhamalla of Śārṅgadhara Saṁhitā (Madhyama khaṇḍa 7/40), Dīpikā commentary says it as karpūra, śaṭī, śatāvarī; चन्द्रप्रभा कर्पूरः एके चन्द्रप्रभा शब्देन शठीं शतावरीं वा कथयन्ति संज्ञाशब्दत्वात् ।।

- Paṇḍita Kāśirama of Gūḍārtha-dipikā commentary karpūra or karpūra-bheda.
- Rasendrasāra-saṅgraha reads candraprabhā as śaṭī.
- Vaidyaka-śabdasindhu writes bākuci and kacora as synonyms of candraprabhā.

### 9. Garbhapāla rasa:

> हिङ्गुलं नागवङ्गौ च त्रिजातं च कटुत्रयम् । धान्यकं कृष्णजीरञ्च चव्यं द्राक्षा सुरद्रुमः ॥
> कर्षमानं पृथक् सर्वं कर्षार्द्धं लोहभस्मकम् । सप्ताहं मर्दयेत्खल्वे विष्णुक्रान्तारसेन च ॥
> गुञ्जा मात्रा च वटिका द्राक्षाक्वाथेन योजयेत् । मासप्रथममारभ्य नवमासान्तमेव च ।
> गर्भिणीरोगनाशार्थं गर्भपालस्तुसंस्मृतः ॥

(B. R. Garbhiṇīrogādhikāra 68/94-96)

Ingredients:

1. Śuddha hiṅgula : 1 karṣa (12 gms)
2. Nāga bhasma : 1 karṣa (12 gms)
3. Vaṅga bhasma : 1 karṣa (12 gms)
4. Twak : 1 karṣa (12 gms)
5. Sūkṣma elā : 1 karṣa (12 gms)
6. Tejapatra : 1 karṣa (12 gms)
7. Śuṇṭhi : 1 karṣa (12 gms)
8. Marica : 1 karṣa (12 gms)
9. Pippalī : 1 karṣa (12 gms)
10. Dhānyaka : 1 karṣa (12 gms)
11. Kṛṣṇa jīraka : 1 karṣa (12 gms)
12. Cavya : 1 karṣa (12 gms)
13. Drākṣā (kalka) : 1 karṣa (12 gms)
14. Devadāru : 1 karṣa (12 gms)
15. Loha bhasma : Half karṣa (6 gms)

- Bhāvanā dravya : Viṣṇukānta rasa (aparājitā swarasa)

Method of preparation:

All the drugs are taken in a clean khalva yantra of appropriate size and triturated to obtain a homogenous mixture. This mixture is now subjected for 7 days trituration with 'aparājitā swarasa' to roll the pills of 1 rattī (125 mgs). The pills are dried in shade and stored in airtight glass containers as 'Garbhapāla rasa'. The pills will be reddish in colour with kaṭu-tikta rasa and rasāyana gandha.

Dosage, adjuvant and therapeutic utility:

One pill (125 mgs) is administered once or twice daily along with 'drākṣā kwātha' from 1st to 9th month of pregnancy. It cures all the garbhiṇī roga. It protects the foetus and takes care of its proper and complete development. Therefore, it is called as 'Garbhapāla rasa'.

### 10. Hiṅguleśvara rasa:

तुल्यांशं मर्दयेत् खल्ले पिप्पलीं हिङ्गुलं विषम् । गुञ्जाऽर्द्धं मधुना देयं वातज्वरनिवृत्तये ॥
(B. R. Jvarādhikāra 5/473)

Ingredients:

1. Pippalī cūrṇa : 1 part
2. Śuddha hiṅgula : 1 part
3. Śuddha vatsanābha : 1 part
- Bhāvanā dravya : Nimbū rasa

Method of preparation:

All the ingredients are taken in equal quantity in a clean khalva yantra and triturated with required quantity of 'nimbū rasa' for a day (8 hours). Later the pills of half rattī (62.5 mgs) are prepared, dried in shade and stored in airtight glass containers for further therapeutic use. The pills will be reddish in color with kaṭu rasa and rasāyana gandha.

Dosage, adjuvant and therapeutic utility:

One pill of half rattī (62.5 mgs) is administered twice or thrice daily depending on the disease condition along with madhu to cure vāta jwara. Original reference is 'Rasendra Cintāmaṇī; Jwarādhikāra 17'.

### 11. Hṛdayārṇava rasa:

सूतार्कौ गन्धकं क्वाथे वराया मर्दयेद् दिनम् । काकमाच्या वटीं कृत्वा चणमात्राञ्च भक्षयेत् ॥
हृदयार्णवनामाऽयं हृद्रोगदलनो रसः ॥
(B. R. Hṛdrogādhikāra 33/38)

Ingredients:

1. Śuddha pārada : 1 part
2. Śuddha gandhaka : 1 part
3. Tāmra bhasma : 1 part
- Bhāvanā dravya : Triphalā kwātha and Kākamācī swarasa

Method of preparation:

Taking śuddha pārada and śuddha gandhaka in a clean khalva yantra and appropriate kajjalī has to be prepared. To it tāmra bhasma is added and homogenously mixed. This mixture is subjected to one bhāvanā each with triphalā kwātha and kākamācī swarasa.

Trituration is carried out for a day to roll the pills of caṇaka (2 rattī) size. The pills are dried in shade and stored in airtight glass containers. The pills will be black in color with kaṣāya rasa and rasāyanagandha.

Dosage, adjuvant and therapeutic utility:

One pill (250 mgs) is administered once or twice daily along with honey to cure all types of hṛdroga. Original reference: Rasendra Cintāmaṇi; Hṛdrogādhikāra 1.

### 12. Kāmadughā rasa:

सुवर्णगैरिकं किञ्चिद्घृतभ्रष्टं विचूर्णयेत् । धात्रीफलरसेनैव सप्तवारञ्च भावयेत् ।।
शुष्कं कृत्वा ततो घर्मे श्लक्ष्णचूर्णन्तु कारयेत् । द्विवल्लप्रमिता मात्रा सिताज्यमधुना सह ।।
रक्तवृद्धिं करोत्याशु पित्तरोगविनाशकृत् । प्रमेहं प्रदरञ्चैव पाण्डुरोगं च कामलाम् ।।
हलीमकं महाघोरमङ्गदाहं तृषं भ्रमम् । जीर्णज्वरहरञ्चैव नात्रकार्या विचारणा ।।
वैद्यानां जीवनार्थाय रोगिणाञ्च हिताय वै । अल्पमूल्यं बहुगुणं ग्रन्थेऽस्मिन्प्रकटीकृतम् ।।

(R. Y. S. Ist part; 'ka' kārādi rasa; Preparation no. 155)

Ingredients:

1. Śuddha swarṇagairīka : 1 part
Bhāvanā dravya : Dhātrī (āmalakī) swarasa

Method of preparation:

Purified 'swarṇagairika' is powdered in a clean khalva yantra and the powder is taken in a vessel and fried with little quantity of ghee. Then the fried drug material is subjected for 7 bhāvanās with 'dhātrī (āmalakī) swarasa'. Later the powder is dried and stored for further use in airtight glass containers.

The powder may be brought in the form of pills of desired size and shape with suitable additives. The pills will be of reddish brown colour with amla-kaṣāya rasa and characteristic odour.

Dosage, adjuvant and therapeutic utility:

The classical dosage is 2 valla (750 mgs) per day in divided doses. It is administered along with sugar, ghee or honey. It is indicated for raktavṛddhi, pittaroga, prameha, pradara, pāṇḍuroga, kāmala, halīmaka, aṅgadāha, tṛṣṇā, bhrama and jīrṇajwara.

### 13. Karpūra rasa:

हिङ्गुलमहिफेनञ्च मुस्तकेन्द्रयवं तथा । जातीफलञ्च कर्पूरं सर्वं सम्मर्द्य यत्नतः ।।
जलेन वटिका कार्या द्विगुञ्जापरिमाणतः । ज्वरातिसारिणे चैव तथाऽतिसाररोगिणे ।
ग्रहणीषट्प्रकारे च रक्तातिसार उल्बणे ।।

(B.R. Atisārādhikāra 7/161-162)

Ingredients:

1. Śuddha hiṅgula : 1 part
2. Śuddha ahiphena : 1 part
3. Mustā : 1 part
4. Indrayava : 1 part
5. Jātīphala : 1 part
6. Karpūra : 1 part

Method of preparation:

The fine powders of all the ingredients are taken in equal quantity in a clean khalva yantra and triturated to obtain a homogenous mixture. Now this mixture is subjected for 1 bhāvanā with jala to roll the pills of 2 rattī (250 mgs).

The pills are dried in shade and stored in airtight glass containers as 'karpūra rasa'. The pills will be reddish in color with tikta rasa and karpūra gandha.

Dosage, adjuvant and therapeutic utility:

One to two pills (250 to 500 mgs) is administered daily with suitable adjuvant to cure jwarātisāra, atisāra and grahaṇī roga.

### 14. Kastūrībhairava rasa:

हिङ्गुलञ्च विषं टङ्कं जातीकोषफले तथा । मरिचं पिप्पली चैव कस्तूरी च समांशिका ।।
रक्तिद्वयं ततः खादेत् सन्निपाते सुदारुणे । (B. R. Jwarādhikāra 5/797)

Ingredients:

| | | | |
|---|---|---|---|
| 1. Śuddha hiṅgula | : 1 part | 5. Jātīphala cūrṇa | : 1 part |
| 2. Śuddha vatsanābha | : 1 part | 6. Marīca cūrṇa | : 1 part |
| 3. Śuddha ṭaṅkaṇa | : 1 part | 7. Pippalī cūrṇa | : 1 part |
| 4. Jāvitrī cūrṇa | : 1 part | 8. Kastūrī | : 1 part |

Method of preparation:

All the ingredients are taken in a clean khalva yantra and triturated well to obtain a homogenous mixture. This mixture in the form of powder is stored in airtight glass containers for further therapeutic use. The medicine will be brownish in color with kaṭu rasa and rasāyana gandha.

Presently we get this formulation in the form of pills by some of the pharmaceutical companies. If we wish to have this powder in the form of pills, the mixture may be preferably triturated with 'ārdraka swarasa' or 'jala' to roll pills of desired size, which are later dried and stored in airtight glass containers.

Dosage, adjuvant and therapeutic utility:

Two rattī (250 mgs) of the medicine is administered once or twice daily along with suitable adjuvant to cure sannipāta jwara. Original reference: Rasendrasārasaṅgraha; Jwara 175.

### 15. Kumārakalyāṇa rasa:

सिन्दूरं मौक्तिकं हेमं व्योमायो हेममाक्षिकम् । कन्यारसेन सम्मर्द्य कुर्यान्मुद्गमिता वटी ।।
वटिकां वटिकार्द्धं वा वयोऽवस्थां विविच्य च । क्षीरेण सितया सार्द्धं बालेषु विनियोजयेत् ।।

कुमाराणां ज्वरं श्वासं वमनं पारिगर्भिकम् । ग्रहदोषाञ्च निखिलान् स्तन्यस्याग्रहणं तथा ।।
कामलामतिसारश्च कृशतां वह्निवैकृतम् । रसः कुमारकल्याणो नाशयेन्नात्र संशयः ।।

(B. R. Bālarogādhikāra 71/116-119)

Ingredients:

| | | | |
|---|---|---|---|
| 1. Rasasindūra | : 1 part | 4. Abhraka bhasma | : 1 part |
| 2. Muktā bhasma | : 1 part | 5. Loha bhasma | : 1 part |
| 3. Swarṇa bhasma | : 1 part | 6. Swarṇa mākṣika bhasma | : 1 part |
| • Bhāvanā dravya | : Kumārī swarasa | | |

Method of preparation:

Rasasindūra is taken in a clean khalva yantra and triturated. It is added with the remaining bhasma and triturated further to obtain a homogenous mixture. This mixture is subjected for 1 bhāvanā with 'kumārī swarasa' to roll the pills of 'mudga' size (half rattī; 60 gms).

The pills are dried in shade and stored in airtight container. The pills will be reddish in colour with tikta rasa and rasāyana gandha.

Dosage, adjuvant and therapeutic utility:

Half to 1 pill (30 to 60 mgs) is administered once or twice daily along with honey followed by intake of warm milk added with sugar. It cures jwara, śwāsa, chardi, pārigarbhika roga, all types of graha-doṣa, aruci, kāmalā, atisāra, emaciation and improper digestion.

### 16. Laghumālinīvasanta rasa:

दरदमथ खगं वै भावयेत्सप्तवारं लकुचफलभवाद्भिश्चायया शोषयेद्वै ।
तदनु मृदुकृशानौ धारयेल्लोहपात्रे दरदपिचुकतुल्यैस्ताम्रचूडोत्थगोलैः ।।
जनितसकलतोयं ढालयेत्तस्य चोद्र्ध्वं असकृदयो दर्व्या घर्षयेत्सावकाशम् ।
गुलिकगमनमात्रं शुष्कताञ्च प्रयातं भवति तु यत्प्रमाणंकर्चूरंस्यात्तदर्धम् ।।
मरिचनिभमथैवं गौरवल्लीजचूर्णं लकुचजनिततोयैर्भावयेत्सप्तवारम् ।
कृतमरिचसमानं दापयेदाज्यखण्डैर्हरति शिशिरतापं जीर्णजूर्तिं समीरम् ।।
मधुमालिनिनामाऽयं वसन्तो वैद्यपूजितः अनुपानविशेषेण बलपुष्टिप्रदायकः ।
गर्भवृद्धिकरश्चाऽसौ गर्भिणीनां सुखावहः रोगनाशात्परं दद्याद्बलकृद्वन्हिवर्धनम् ।।

(R. Y. S. II part; 'ma' kārādi rasa; Preparation no 519)

Ingredients:

| | |
|---|---|
| 1. Śuddha hiṅgula | : 1 part |
| 2. Abhraka bhasma | : 1 part |
| 3. Kukkuṭāṇḍa majjā | : 2 parts |

4. Karcūra : Half of the obatained drug material.
5. Marīca : Half of the obatained drug material.
- Bhāvanā dravya : Lakucapatra swarasa

Method of preparation:

Take the ingredients in a khalva yantra and powder them properly. This powder is subjected to 7 bhāvanās with 'lakuca phala swarasa' and dry in shade. This dry powder is taken in a strong wide mouthed vessel (kaḍhāhī) which is placed over the heat produced by glowing charcoal of 'badara kāṣṭha'. To it equal quantity of 'kukuṭāṇḍa majjā' is added and stirred continuously until it becomes viscous in consistency.

Later it is added with its half quantity of karcūra and half the quantity of 'marīca' and the mixture again subjected for 7 bhāvanās with 'lakucaphala swarasa' to roll pills of 1 rattī size. The pills are dried in shade and stored in airtight glass containers.

Dosage, adjuvant and therapeutic utility:

One rattī (125 mg) of this medicine is administered along with ghee or sugar. It is indicated in śiśiratāpa, jīrṇajwara and vātaja roga. It enhances physical strength, nourishment, chances of conception and appetite.

### 17. Sūtaśekhara rasa:

शुद्धं सूतं मृतं स्वर्णं टङ्कणं वत्सनागकम् । व्योषमुन्मत्तबीजं च गन्धकं ताम्रभस्मकम् ।।
चतुर्जातं शङ्खभस्म बिल्वमज्जा कचोरकम् । सर्वं समं क्षिपेत्खल्वे मर्घ्यं भृङ्गरसैर्दिनम् ।।
गुञ्जामात्रां वटीं कृत्वा द्विगुञ्जे मधुसर्पिषी । भक्षयेदम्लपित्तघ्नो वान्तिशूलामयापहः ।।
पञ्च गुल्मान्पञ्च कासान्ग्रहण्यामयनाशनः । त्रिदोषोत्थातिसारघ्नः श्वासमन्दाग्निनाशनः ।।
उग्रहिक्कामुदावर्तं देहयाप्यगदापहः । मण्डलान्नात्र संदेहः सर्वरोगहरः परः ।।
राजयक्ष्महरः साक्षाद्रसोऽयं सूतशेखरः । (Y. R. Uttarārdha; Āmlapitta cikitsā)

Ingredients:

1. Śuddha pārada : 1 part
2. Swarṇa bhasma : 1 part
3. Śuddha ṭaṅkaṇa : 1 part
4. Śuddha vatsanābha : 1 part
5. Trikaṭu cūrṇa : 1 part (each)
6. Śuddha dhattūra bīja : 1 part
7. Śuddha gandhaka : 1 part
8. Tāmra bhasma : 1 part
9. Caturjāta cūrṇa : 1 part (each)
10. Śaṅkha bhasma : 1 part
11. Bilva majjā : 1 part
12. Kacora cūrṇa : 1 part
- Bhāvanā dravya : Bhṛṅgarāja swarasa

Method of preparation:

Taking śuddha pārada and śuddha gandhaka in a clean khalva yantra, appropriate kajjalī has to be prepared. To it the fine powder of remaining ingredients are added one by one and homogenously mixed.

This mixture is subjected to 1 bhāvanā with 'bhṛṅgarāja swarasa' to roll the pills of 1 rattī pramāṇa, which are later dried in shade and stored in airtight glass containers. The pills will be greyish in colour with 'kaṣāya-tikta' rasa and characteristic odour.

Dosage, adjuvant and therapeutic utility:

One to two pills (125 to 250 mgs) is administered twice or thrice daily along with honey or ghee. It is useful in amlapitta, chardi, śūla, 5 types of gulma and kāsa, grahaṇī, atisāra, śwāsa, mandāgni, severe hikkā, udāvarta etc. It cures rājayakṣma if taken for a time period of 1 maṇḍala (18 days).

Note: This formulation is widely used in majority of Āyurveda clinics and hospitals. It proves to be the best substitute for the gastritis patients who use lot of allopathic antacids and no more get benefitted.

**18. Laghusūtaśekhara rasa:** (Ānubhūta yoga)

This is an anubhūta yoga which was developed on the reference of 'Sūtaśekhara rasa' from Yogaratnākara Uttarārdha, Amlapitta cikitsā, page 244. The only difference in Laghusūtaśekhara rasa from Sūtaśekhara rasa is 'swarṇa mākṣika bhasma' used in the place of 'swarṇa bhasma'.

Leaving this, the ingredients, method of preparation and indications are same as that of 'sūtaśekhara rasa'.

Note: 'Swarṇa mākṣika bhasma' is pratinidhi dravya for 'swarṇa bhasma'.

**19. Lakṣmīvilāsa rasa (Nāradīya):**

पलं कृष्णाभ्रचूर्णस्य तदर्द्धौ रसगन्धकौ । तदर्धं चन्द्रसंज्ञस्य जातीकोपफले तथा ।।
वृद्धदारकबीजं च बीजं धुस्तूरकस्य च । त्रैलोक्यविजयाबीजं विदारीमूलमेव च ।।
नारायणी तथा नागबला चातिबला तथा । बीजं गोक्षुरकस्यापि नैचुलं बीजमेव च ।।
एतेषां कार्षिकं चूर्णं पर्णपत्ररसैः पुनः । निष्पिष्य वटिका कार्या त्रिगुञ्जाफलमानतः ।।
निहन्ति सन्निपातोत्थान् घोरांश्चैव चतुर्विधान् । वातोत्थान् पैत्तिकांश्चैव नास्त्यत्र नियमः क्वचित् ।।
कुष्ठमष्टादशविधं प्रमेहान् विंशतिं तथा । नाडीव्रणं व्रणं घोरं गुदामयभगन्दरम् ।।
श्लीपदं कफवातोत्थं रक्तमांसाश्रितं च यत् । मेदोगतं धातुगतं चिरजं कुलसम्भवम् ।।
गलशोथमन्त्रवृद्धिमतिसारं सुदारुणम् । आमवातं सर्वरूपं जिह्वास्तम्भं गलग्रहम् ।

उदरं कर्णनासाऽक्षिमुखवैकृतमेव च । कासपीनसयक्ष्मार्शःस्थौल्यदुर्गन्धनाशनः ।।
सर्वशूलं शिरःशूलं स्त्रीणां गदनिषूदनम् । वटिकां प्रातरेकैकां खादेन्नित्यं यथाबलम् ।।
अनुपानमिह प्रोक्तं माषपिष्टं पयो दधि । वारिभक्तसुरासीधुसेवनात् कामरूपधृक् ।।
वृद्धोऽपि तरुणस्पर्धी न च शुक्रस्य संक्षयः । न च लिङ्गस्य शैथिल्यं न केशा यान्ति पक्वताम् ।।
नित्यं स्त्रीणां शतं गच्छेन्मत्तवारणविक्रमः । द्विलक्षयोजनी दृष्टिर्जायते पौष्टिकं परः ।।
प्रोक्तः प्रयोगराजोऽयं नारदेन महात्मना । रसो लक्ष्मीविलासस्तु वसुदेवो जगत्पतिः ।
अभ्यासादस्य भगवांल्लक्षनारीषु वल्लभः ।।

(B. R. Jwarādhikāra 5/1200-1213)

Ingredients:

| | |
|---|---|
| 1. Abhraka bhasma | : 1 pala (48 gms) |
| 2. Śuddha pārada | : half pala (24 gms) |
| 3. Śuddha gandhaka | : half pala (24 gms) |
| 4. Karpūra | : half pala (24 gms) |
| 5. Jāvitrī cūrṇa | : half pala (24 gms) |
| 6. Jātīphala cūrṇa | : half pala (24 gms) |
| 7. Vṛddhadāruka bīja cūrṇa | : 1 karṣa (12 gms) |
| 8. Dhattūra bīja cūrṇa | : 1 karṣa (12 gms) |
| 9. Bhāṅga patra cūrṇa | : 1 karṣa (12 gms) |
| 10. Vidārīkanda cūrṇa | : 1 karṣa (12 gms) |
| 11. Śatāvarī cūrṇa | : 1 karṣa (12 gms) |
| 12. Nāgabalā cūrṇa | : 1 karṣa (12 gms) |
| 13. Atibalā cūrṇa | : 1 karṣa (12 gms) |
| 14. Gokṣurabīja cūrṇa | : 1 karṣa (12 gms) |
| 15. Naicula bīja cūrṇa | : 1 karṣa (12 gms) |

Method of preparation:

Taking śuddha pārada and śuddha gandhaka in a clean khalva yantra appropriate kajjalī has to be prepared. To it all the remaining ingredients are added and triturated to obtain a homogenous mixture.

This mixture is subjected for 1 bhāvanā with nāgavallī patra (parṇapatra) swarasa to roll pills of 3 rattī (375 mgs). The pills are later dried under sun and stored in airtight glass containers. The pills will be ash in color with tikta rasa and characteristic odour.

Dosage, adjuvant and therapeutic utility:

One pill (325 mgs) is administered once daily in the morning along with māṣa kalka, milk, curd, jala, surā or sidhu. It cures severe sannipātika roga despite of any doṣa predominance, 18 types of kuṣṭha, 20 types of prameha, nāḍī-vraṇa, severe other vraṇa, gudaroga, bhagandara, ślīpada (which is kapha-vātaja, rakta-māṁsa-medāśrita, chronic and hereditary), galaśotha, āntra-vṛddhi, mighty atisāra, all types of āmavāta, jihvāsthambha, galagraha, udararoga, karṇa-nāsā-netra-mukha vikṛti, kāsa, pīnasa, yakṣma, arśas, sthoulya, deha-durgandha, all types of śūla, śiraḥśūla and all gynecological diseases.

Its usage makes a man as powerful as 'Kāmadeva' (a mythological character known for sexual vigor). Old men regain sexual vigor as that of young and hardly suffer with śukrakṣaya or loss of erection. The hairs do not grey. Men will have the sexual vigor of an elephant. No other puṣṭikāraka medicine like is available. This formulation was revealed by 'Nārada Maharṣi' to Lord Viṣṇu.

Note: The last 8 lines of the verse make tall claims about the formulation which are cooked up to a greater extent. These claims trivialize the seriousness of the formulation and serve no better purpose. (Original reference: Rasendra Cintāmaṇī; Kapharogādhikāra 28-40)

**20. Mahālakṣmīvilāsa rasa:**

लौहनभ्रं विषं मुस्तं फलत्रयकटुत्रयम् । धुस्तूरं वृद्धदारञ्च बीजमिन्द्राशनस्य च ।।
गोक्षुरकद्वयञ्चैव पिप्पलीमूलमेव च । एतत्सर्वं समं ग्राह्यं रसे धुस्तूरकस्य च ।।
भावयित्वा वटी कार्या द्विगुञ्जाफलमानतः । महालक्ष्मीविलासोऽयं सन्निपातनिवारकः ।।

(B. R. Śirorogādhikāra 65/57-59)

Ingredients:

| | | | | | |
|---|---|---|---|---|---|
| 1. Loha bhasma | : | 1 part | 9. Vibhītakī | : | 1 part |
| 2. Abhraka bhasma | : | 1 part | 10. Āmalakī | : | 1 part |
| 3. Śuddha vatsanābha | : | 1 part | 11. Śuddha dhattūra bīja | : | 1 part |
| 4. Mustā | : | 1 part | 12. Vṛddhadāru bīja | : | 1 part |
| 5. Śuṇṭhī | : | 1 part | 13. Śuddha bhāṅga | : | 1 part |
| 6. Marīca | : | 1 part | 14. Bṛhat gokṣura | : | 1 part |
| 7. Pippalī | : | 1 part | 15. Sūkṣma gokṣura | : | 1 part |
| 8. Harītakī | : | 1 part | 16. Pippalī mūla | : | 1 part |
| • Bhāvanā dravya | : | Dhattūrapatra swarasa | | | |

Method of preparation:

All the ingredients are taken in equal quantity in a clean khalva yantra and

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triturated to obtain a homogenous mixture. This mixture is now subjected for 1 bhāvanā with 'dhattūrapatra swarasa' to roll the pills of 2 rattī (250 mgs).

The pills are dried in shade and stored in airtight glass containers as 'mahālakṣmīvilāsa rasa'. The pills will be of ash colour with kaṭu-kaṣāya rasa and rasāyana gandha.

Dosage, adjuvant and therapeutic utility:

One pill (250 mgs) is administered twice daily along with honey. It cures all types of śiroroga. Original reference: Rasendrasārasaṅgraha; Śiroroga cikitsā 13-15

### 21. Loha rasāyana or Kārśyahara louha:

श्वेतापुनर्नवादन्तीवाजिगन्धात्रिकत्रयैः । शतमूलीवलायुक्तैरेभिर्लौहं प्रसाधितम् ।।
हिनस्ति नियतं कार्श्यमपि भृङ्गरसैः सह । नास्त्यनेन समं लौहं सर्वरोगान्तकं मतम् ।
दीपनं बलवर्णाग्नेर्वृष्यदं चोत्तमोत्तमम् ।।

(B.R. Rasāyanādhikāra 73/55-46)

Ingredients:

| | | | |
|---|---|---|---|
| 1. Śweta punarnavā cūrṇa | : 1 part | 9. Pippalī cūrṇa | : 1 part |
| 2. Dantīmūla cūrṇa | : 1 part | 10. Mustā cūrṇa | : 1 part |
| 3. Aśwagandhā cūrṇa | : 1 part | 11. Citrakamūla cūrṇa | : 1 part |
| 4. Harītakī cūrṇa | : 1 part | 12. Viḍaṅga cūrṇa | : 1 part |
| 5. Vibhītakī cūrṇa | : 1 part | 13. Śatāvarī cūrṇa | : 1 part |
| 6. Āmalakī cūrṇa | : 1 part | 14. Balāmūla cūrṇa | : 1 part |
| 7. Śuṇṭhī cūrṇa | : 1 part | 15. Loha bhasma | : 14 parts |
| 8. Marīica cūrṇa | : 1 part | | |

Method of preparation:

The fine powders of all the ingredients are taken in a clean khalva yantra one by one, triturated and mixed homogenously. The final homogenous mixture is stored in suitable airtight container as 'loha rasāyana'.

Dosage, adjuvant and therapeutic utility:

Four rattī (500 mgs) of this medicine is administered twice daily along with half pala (24 ml) of 'bhṛṅgarāja swarasa'. This medicine is useful in extremely thin and lean persons. It helps to put on some weight in such people. It is indicated in all the diseases with different adjuvant. There is no other 'loha rasāyana' other than this. Its regular use improves strength, complexion, appetite and virility.

### 22. Makaradhwaja rasa:

स्वर्णभागौ च वङ्गं च मौक्तिकं कान्तलौहकम् । जातीकोषफले रूप्यं कांस्यकं रससिन्दूरम् ।।
चन्द्रं प्रवालं कस्तूरी अभ्रकं चैकभागिकम् । स्वर्णसिन्दूरतो भागांश्चतुरः कल्पयेद् बुधः ।।
नातः परतरः श्रेष्ठः सर्वरोगनिषूदनः । सर्वलोकहितार्थाय शिवेन परिकीर्तितः ।।

(B. R. Rasāyanādhikāra 73/82-84)

Ingredients:

| | | | |
|---|---|---|---|
| 1. Swarṇa bhasma | 2 parts | 8. Kāṁsya bhasma | 1 part |
| 2. Vaṅga bhasma | 1 part | 9. Rasasindūra | 4 parts |
| 3. Muktā piṣṭi bhasma | 1 part | 10. Karpūra | 1 part |
| 4. Kāntaloha bhasma | 1 part | 11. Pravāla bhasma | 1 part |
| 5. Jāvitrī cūrṇa | 1 part | 12. Kastūrī | 1 part |
| 6. Jātī phala cūrṇa | 1 part | 13. Abhraka bhasma | 1 part |
| 7. Rajata bhasma | 1 part | | |

Method of preparation:

Rasasindūra is taken in a clean khalva yantra and triturated. To it, all the remaining ingredients are added and triturated to obtain a homogenous mixture. This mixture is triturated with required quantity of 'water' to roll the pills of 1 rattī (125 mgs). The pills are dried in shade and stored in airtight container.

Dosage, adjuvant and therapeutic utility:

After proper deha-śuddhi, one pill (125 mgs) is consumed twice daily along with suitable adjuvant to cure wide range of disease conditions. There is no better rasāyana than this.

Note: For the benefit of humankind, this medicine was formulated by a seer named 'Śiva'. (Original reference: Rasendrasārasaṅgraha; Rasāyana-vājīkaraṇādhikāra 77-79)

### 23. Mugdha rasa (Grey powder):

युगतोलप्रंमाणं विमलीकृतं रसेशम् । द्विगुणां खटीञ्च शुद्धां निदधीत खल्वमध्ये ।।
परिपेषयेत्तु तावत् विधिनेतदीयचूर्णम् । अवलोक्यते न यावत्खलु चन्द्रिकाविहीनम् ।।
हतचन्द्रिकं तु चूर्णं ह्यवबुध्य: योजयेद्वै । विबुधैः स्मृतो रसोऽयं खलु मुग्धनामधेयः ।।

(R. T. 6/9-11)

Ingredients:

| | | | |
|---|---|---|---|
| 1. Śuddha pārada | 1 part | 2. Śuddha khaṭikā (chalk) | 2 parts |

Method of preparation:

Śuddha khaṭikā cūrṇa is put in a clean khalva yantra, śuddha pārada is carefully added to it and triturated. The trituration is carried out until the powder attains greyish colour with no shiny particles of pārada seen in it (niścandratva).

This may take around 2 to 3 days if triturated for 8 hours a day. This grey coloured powder is stored in an airtight glass container for further use as 'mugdha rasa'.

**Mugdha rasa- properties:**

उदरामयनुत् वमिहृन्नियतं सहजोत्थफिरङ्गकुरङ्गहरिः ।
शिशुरोगहरस्तु विशेषतया विबुधैरुदितः खलु मुग्धरसः ।। (R. T. 6/12)

Mugdha rasa when administered internally in suitable dosage, it is said to be effective in atisāra (diarrhoea), vamana (nausea and vomiting) and sahaja phiraṅga (congenital syphilis). This medicine is especially useful in pediatric abdominal ailments (udara roga).

Note: This medicine is specially indicated in all types of 'diarrhea' in children, but it is quite rarely used in practice. The prominent cause for its less usage is the apprehensions about its safety as it is a 'nirgandha mūrcchita yoga'. These apprehensions may be addressed only through appropriate analytical, toxicological, experimental and clinical research works.

**Mugdha rasa- dosage:**

गुञ्जार्धतः समारभ्य सार्द्धगुञ्जद्वयोन्मिता । पूर्णमात्रा मता मुग्धरसस्य तरुणोचिता ।।
गुञ्जाष्टमांशतश्चास्य गुञ्जापादांशसंमिता । पूर्णमात्रा मता विज्ञैर्वार्षिकस्यार्भकस्य तु ।।
(R. T. 6/13-14)

Adult dose of 'mugdha rasa' is half rattī (62.5 gms) to 2.5 rattī (312.5 gms). For children aged one year and above the dosage will be from 1 grain of rice ($1/8^{th}$ rattī; 15.5 gms) to $1/4^{th}$ rattī (31.25 gms).

Mugdha rasa- Dosage, adjuvant and therapeutic utility:

गुञ्जैकसंमितो मुग्धरसस्तु सलिलान्वितः । मासमेकं द्वयं वाऽपि यत्नतः परिशीलितः ।।
गर्भिणीनां चिरोद्भूतां नवजातामथापि वा । फिरङ्गजनितां बाधां नाशयत्यविलम्बितम् ।।
गुञ्जापादोन्मितो मुग्धरसो नीरेण शीलितः । शिशूनां विनिहन्त्याशु फिरङ्गं सहजोत्थितम् ।।
रक्तिकाङ्घ्रिमितो मुग्धरसो वारा नियोजितः । विनिहन्त्याशु बालानामतिसारं सुनिश्चितम् ।।
विज्ञाय रोगोपशमं प्राणाचार्यो भिषग्वरः । न योजयेन्मुग्धरसं रससिन्दूरवद् भृशम् ।।
(R. T. 6/15-19)

One rattī (125 mgs) of 'mugdha rasa' administered daily along with water for a month or two will cure acute or chronic syphilis of pregnant women. Quarter rattī (31.25 mgs) of 'mugdha rasa' administered daily along with water for a week or two will cure 'sahaja phiraṅga' (congenital syphilis) in children. The same dosage (1/4 rattī; 31.25 mgs) of 'mugdha rasa' administered daily along with water for a week will cure 'atisāra' in children.

Mugdha rasa' is a 'nirgandha mūrcchita pārada yoga' (mercury compound with no sulphur). Therefore, its administration should not be prolonged after the disease symptoms subside as done during administration of 'rasasindūra' which is a 'sagandha mūrcchita pārada yoga' (mercury compound with sulphur).

With prolonged administration of any 'sagandha mūrcchita pārada yoga', the physician anticipates its rasāyana influence over the body, but the case is not same with any of the 'nirgandha mūrcchita pārada yoga'. These 'nirgandha mūrcchita pārada yoga' (mugdha rasa) with prolonged administration do cause severe toxic effects on the body.

**24. Navāyasa lauha:**

त्र्यूषणत्रिफलामुस्तविडङ्गचित्रकाः समाः । नवायोरजसो भागास्तच्चूर्णं मधुसर्पिषा ।
भक्षयेत् पाण्डुहृद्रोगकुष्ठार्शःकामलापहम् ॥

(B.R. Pāṇḍurogādhikāra12/28)

Ingredients:

| | |
|---|---|
| 1. Śuṇṭī cūrṇa | : 1 part |
| 2. Marīca cūrṇa | : 1 part |
| 3. Pippalī cūrṇa | : 1 part |
| 4. Harītakī cūrṇa | : 1 part |
| 5. Vibhītakī cūrṇa | : 1 part |
| 6. Āmalakī cūrṇa | : 1 part |
| 7. Mustā cūrṇa | : 1 part |
| 8. Citraka cūrṇa | : 1 part |
| 9. Viḍaṅga cūrṇa | : 1 part |
| 10. Loha bhasma | : 9 parts |

Method of preparation:

Ingredients from 1 to 9 are powdered separately and vastragālita cūrṇa is homogenously mixed with loha bhasma by triturating it in a clean khalva yantra. The end product in powder form is stored in airtight wide mouthed glass containers for further use.

Now-a-days we find machine made tablets of this formulation in market and are largely in use. The tablets will be reddish colored powder with kaṭu-kaṣāya rasa and characteristic odor.

Dosage, adjuvant and therapeutic utility:

Two to 4 rattī (250 mgs to 500 mgs) is administered daily along with honey and ghee taken in unequal ratio. It is useful in curing pāṇḍu, hṛdroga, kuṣṭha, arśas and kāmalā roga. (Original reference: Ca. Ci. 16/70-71)

### 25. Pratāpalaṅkeśvara rasa:

अपामार्गस्य मूलानां चूर्णं चित्रकमूलजैः । वल्कलैर्मर्दयित्वाऽथ रसं वस्त्रेण गालयेत् ॥
तेन सूतसमं गन्धमभ्रकं पारदं विषम् । टङ्कणं तालकञ्चैव मर्दयेद्दिनसप्तकम् ॥
त्रिदिनं मुशलीकन्दैर्मर्दयेद् घर्मरक्षितम् । मूषाञ्च गोस्तनाकारामापूर्योपरि ढक्कयेत् ॥
सप्तभिर्मृत्तिकावस्त्रैर्वेष्टयित्वा पुटेल्लघु । रसतुल्यं लौभस्म मृतवङ्गमहिन्तथा ॥
मधूकसारजलदं रेणुकं गुग्गुलुं शिलाम् । चाम्पेयञ्च समांशं स्याद्भागार्द्धं शोधितं विषम् ॥
तत्सर्वं मर्दयेत् खल्ले भावयेद्विपनीरतः । आतपे सप्तधा तीव्रं मर्दयेद्घटिकाद्वयम् ॥
कटुत्रयकषायेण कनकस्य रसेन च । फलत्रयकषायेण मुनिपुष्परसेन च ॥
समुद्रफलनीरेण विजयापत्रवारिणा । चित्रकस्य कषायेण ज्वालामुख्या रसेन च ॥
प्रत्येकं सप्तधा भाव्यं तद्वत्पित्तैश्च पञ्चभिः । सर्वस्य समभागेन विषेण परिधूपयेत् ॥
विमर्ध म्रक्षयित्वा च रक्षयेत्कूपिकोदरे । गुञ्जैकं वन्हिनीरेण शृङ्गवेररसेन वा ॥
दध्याच्च रोगिणे तीव्रमौढ्यविस्मृतिशान्तये । क्षुरेण तालुमाहत्य घर्षयेदार्द्रनीरतः ॥
नोद्घटन्ते यदा दन्तास्तदा कुर्यादमुं विधिम् । सेचयेन्मन्त्रविद्वैद्यो वारिकुम्भशतैर्नरम् ॥
भोजनेच्छा यदा तस्य जायते रोगिणः परम् । दध्योदनं सितायुक्तं दद्यात्तक्रं सजीरकम् ॥
पाने पानं सिताजातं यदिच्छेदाददीत तत् । एवं कृतेन शान्तिः स्यात्तापस्य च रुजस्तथा ॥
सचन्द्रचन्दनरसालेपनं कुरु शीतलम् । यूथिकामल्लिकाजातीपुन्नागवकुलावृताम् ॥
विधाय शय्यां तत्रस्थां लेपनैश्चन्द्रनैर्मुहुः । हावभावविलासोक्तैः कटाक्षैश्चञ्चलेक्षणैः ॥
पीनोत्तुङ्गकुचापीडैः कामिनीपरिरम्भणैः । रम्यवीणानिनादोक्तैर्गायनैः श्रवणामृतैः ॥
पुण्यश्लोककथाद्यैश्च सन्तापहरणं कुरु । दद्याद्वातेषु सर्वेषुसिन्धुजैः सह वन्हिभिः ॥
दद्यात्कणामाक्षिकाभ्यां कामलाह्वयपाण्डुषु । तत्तद्रोगानुपानेन सर्वरोगेषु योजयेत् ॥
अयं प्रतापलङ्केशः सन्निपातहरः परः ॥ (B. R. Jwarādhikāra 5/823-841)

Ingredients:

| | | | |
|---|---|---|---|
| 1. Śuddha pārada | : 1 part | 10. Madhūka puṣpasāra | : 1 part |
| 2. Śuddha gandhaka | : 1 part | 11. Mustā curṇa | : 1 part |
| 3. Abhraka bhasma | : 1 part | 12. Reṇukā cūrṇa | : 1 part |
| 4. Śuddha vatsanābha | : 1 part | 13. Śuddha guggulu | : 1 part |
| 5. Śuddha ṭaṅkaṇa | : 1 part | 14. Śuddha manaḥśilā | : 1 part |
| 6. Śuddha haratāla | : 1 part | 15. Nāgakeśara cūrṇa | : 1 part |
| 7. Loha bhasma | : 1 part | 16. Śuddha vatsanābha | : 1/2 part |
| 8. Vaṅga bhasma | : 1 part | 17. Śuddha vatsanābha | : Dhūpa nārtha |
| 9. Nāga bhasma | : 1 part | | |

- Bhāvanā dravya:

| | |
|---|---|
| 1. Apāmārga swarasa | : 7 bhāvanās |

2. Citrakamūla kwātha : 7 bhāvanās
3. Muśalī kwātha : 3 bhāvanās
4. Vatsanābha kwātha : 7 bhāvanās
5. Trikaṭu kwātha : 7 bhāvanās
6. Dhatūrapatra swarasa : 7 bhāvanās
7. Triphalā kwātha : 7 bhāvanās
8. Agastyapuṣpa rasa : 7 bhāvanās
9. Samudraphala swarasa : 7 bhāvanās
10. Vijaya kwātha : 7 bhāvanās
11. Citraka mūla kwātha : 7 bhāvanās
12. Lāṅgalī mūla rasa : 7 bhāvanās
13. Pañcapitta : 7 bhāvanās
    (Pitta of fish, buffalo, goat, pig and peacock)

Method of preparation:

Taking śuddha pārada and śuddha gandhaka in a clean khalva yantra appropriate kajjalī has to be prepared. To it the fine powders of ingredients from 3 to 6 are added one by one and homogenously mixed.

This mixture is subjected to 7 bhāvanās each with 'apāmārga swarasa' and 'citrakamūla kwātha' for 7 days. The mixture is again subjected for 3 bhāvanās with 'muśalī kwātha'. Later it is collected in an appropriate sized mūṣā and its mouth is properly sealed with a lid using 7 layers of cloth and mud. When the sealed part dries up, the mūṣā is placed in bhūdhara puṭa and subjected for heat.

When the mūṣā cools down on its own, its seal is removed and the product inside is taken in khalva yantra and triturated. This is added with fine powder of ingredients from 7 to 16 and the mixture is again subjected for 7 bhāvanās each with above mentioned 1 to 13 bhāvanā dravya under hot sun.

Now the product obtained is weighed and equal to its quantity 'śuddha vatsanābha' is taken. First śuddha vatsanābha is made into coarse powder and filled into a small wide mouthed vessel. This vessel has to be placed over a smokeless oven with glowing charcoal in it. Over the mouth of the vessel place a sieve with enough smaller meshes to hold the particles of vatsanābha. Now spread vatsanābha coarse powder over the mesh and leave it undisturbed until the oven cools down on its own. Later collect the drug powder from the mesh, triturate and store in an airtight container for further use. The medicine will be blackish in color with sharp taste and smoky odour.

See that the process is carried out in a remote place and one does not come in contact with its fumes for a longer time as its smoke may pose some health hazards.

Dosage, adjuvant and therapeutic utility:

One rattī (125 mgs) of this medicine is administered daily along with citrakamūla kwātha or ārdraka rasa to bring back the consciousness of sannipāta jwara patient. If patient doesn't regain his consciousness by above treatment, a small cut is done over the palate and medicine rubbed into it. Even if this treatment also fails then, after consultation with āpta vaidya 100 pots of cold water has to be poured over the head of the patient.

After gaining consciousness, if patient feels hungry, he should be fed with cooked rice, curd and sugar; a drink of butter milk along with fried jīraka is advised; different types of pānaka and pānīya preparations may be given. The food of patient's desire is given to mitigate the symptoms of fever. If the fever doesn't subside with all these medicine, then candanādi lepa is done over the body of the patient and asked to lie down on a bed covered with variety of flowers (yūthikā, mallikā, jātī, punnāga, bakula and gulāba) wearing the garland of these flowers. Conversation with good looking women, candanādi lepa and embrace from woman, listening to soothing music and songs and listening to the stories of purāṇa may mitigate the symptoms of fever.

In vātaja ailments this medicine is given along with saindhava lavaṇa and citrakamūla kwātha. In kāmalā and pāṇḍu roga, it is given with pippalī cūrṇa and madhu. This medicine is useful in all the disease conditions with different anupānas but this is medicine of choice in sannipāta jwara.

Comment: This preparation is quite lengthy and laborious. Bhāvanā with pañcapitta is something non practical. If the verse of this preparation is read from 21st line onwards, the practice of bringing back the conscience of an unconscious sannipātika jwara patient seems completely old-fashioned and frivolous. (Original reference: Bṛhat-rasarāja-sundara; Uttara-khaṇḍa)

### 26. Pravālapañcāmṛta rasa:

प्रवालमुक्ताफलशङ्खशुक्तिकपर्दिकानां च समांशभागम् ।
प्रवालमात्रं द्विगुणं प्रयोज्यं सर्वैः समांशं रविदुग्धमेव ॥
एकीकृतं तत्खलु भाण्डमध्ये क्षिप्त्वा मुखे बन्धनमत्र योज्यम् ।
पुटं विदध्यादतिशीतले च उद्धृत्य तद्भस्मक्षिपेत्करण्डे ॥
नित्यं द्विवारं प्रतिपाकयुक्तं वल्लप्रमाणं हि नरेण सेव्यम् ।

आनाहगुल्मोदरप्लीहकासश्वासाग्निमान्द्यान् कफमारुतोत्थान् ।।
अजीर्णमुद्गारहृदामयघ्नं ग्रहण्यतीसारविकारनाशनम् ।।
मेहामयं मूत्ररोगं मूत्रकृच्छ्रं तथाऽश्मरीम् । नाशयेन्नात्र सन्देहः सत्यं गुरुवचो यथा ।।
पथ्याश्रितं भोजनमादरेण समाचरेन्निर्मलचित्तवृत्त्या। प्रवालपञ्चामृतनामधेयो योगोत्तमः सर्वगदपहारी।।

(B. R. Gulmarogādhikāra 32/113-117)

Ingredients:

| | | | |
|---|---|---|---|
| 1. Pravāla bhasma | : 2 parts | 4. Śukti bhasma | : 1 part |
| 2. Muktā bhasma | : 1 part | 5. Kapardikā bhasma | : 1 part |
| 3. Śaṅkha bhasma | : 1 part | 6. Arka dugdha | : 1 part |

Method of preparation:

All the bhasma are taken in a clean and khalva yantra and triturated to obtain a homogenous mixture. This mixture is subjected for 1 bhāvanā for a day with 'arka dugdha'. From this drug mass cakrikās of suitable size are prepared. They are dried, enclosed in 'śarāva sampuṭa' and subjected for 1 day's heat in 'bhāṇḍapuṭa' (kumbha puṭa).

When cool on its own, the inner drug material is triturated and stored in suitable airtight containers for further therapeutic use. The medicine will be whitish in color with kṣārīya rasa and no specific odour.

Dosage, adjuvant and therapeutic utility:

One valla (3 rattī; 375 mgs) of the medicine is administered daily along with honey or any other suitable adjuvant. It is indicated in ānāha, gulma, udararoga, plīhā roga, śwāsa, agnimāndya, ajīrṇa, udgārabāhulya, hṛdroga, grahaṇī roga, atisāra, mūtrakṛccra, prameha and aśmarī roga.

### 27. Punarnavādi maṇḍūra:

पुनर्नवा त्रिवृच्छुण्ठी पिप्पली मरिचानि च । विडङ्गं देवकाष्ठञ्च चित्रकं पुष्कराह्वयम् ।।
त्रिफला द्वे हरिद्रे च दन्ती च चविका तथा । कुटजस्य फलं तिक्ता पिप्पलीमूलमुस्तकम् ।।
एतानि समभागानि मण्डूरं द्विगुणं ततः । गोमूत्रेऽष्टगुणे पक्त्वा स्थापयेत् स्निग्धभाजने ।
पाण्डुशोथोदरानाहशूलार्शः कृमिगुल्मनुत् ।।

(B. R. Pāṇāurogādhikāra 12/63-65)

Ingredients:

| | | | |
|---|---|---|---|
| 1. Punarnavā mūla | : 1 part | 5. Pippalī | : 1 part |
| 2. Trivṛt | : 1 part | 6. Viḍaṅga | : 1 part |
| 3. Śuṇṭī | : 1 part | 7. Devadāru | : 1 part |
| 4. Marīca | : 1 part | 8. Citraka mūla | : 1 part |

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| | | | |
|---|---|---|---|
| 9. Puṣkara mūla | 1 part | 17. Indrayava | 1 part |
| 10. Harītakī | 1 part | 18. Kaṭukī | 1 part |
| 11. Vibhītakī | 1 part | 19. Pippalī mūla | 1 part |
| 12. Āmalakī | 1 part | 20. Mustā | 1 part |
| 13. Haridrā | 1 part | 21. Śuddha maṇḍūra cūrṇa | 40 parts |
| 14. Dāruharidrā | 1 part | 22. Gomūtra | 480 parts |
| 15. Dantī mūla | 1 part | | |
| 16. Cavya | 1 part | | |

Method of preparation:

All the herbal drugs from 1 to 20 are powdered separately and vastragālita cūrṇa is homogenously mixed with maṇḍūra bhasma by triturating in a clean khalva yantra.

This mixture is taken in a iron vessel with 8 times of gomūtra and boiled until all the liquid part gets evaporated. The drug powder is now dried under hot sun, powdered and preserved in airtight containers for further use. The end product will be will be blackish in color with kaṭu-tikta rasa and gomūtra gandha.

Dosage, adjuvant and therapeutic utility:

Half māṣa (500 mgs) is administered daily along with madhu to cure pāṇḍu, śotha, udara, ānāha, śūla, arśaroga, kṛmi and gulmaroga. (Original reference: Ca. Ci. 16/93-96)

### 28. Viṣamajwarāntaka lauha (puṭapakwa):

हिङ्गुलसम्भवं सूतं गन्धकेन सुकज्जलीम् । पर्पटीरसवत्पाच्यं सूताङ्घ्रिहेमभस्मकम् ।।
लौहं ताम्रमभ्रकञ्च रसस्य द्विगुणं तथा । वङ्गकं गैरिकञ्चैव प्रवालञ्च रसार्द्धकम् ।।
मुक्ताशङ्खं शक्तिभस्म प्रदेयं रसपादिकम् । मुक्तागृहे च संस्थाप्य पुटपाकेन साधयेत् ।।
भक्षयेत्प्रातरुत्थाय द्विगुञ्जाफलमानतः । अनुपानं प्रयोक्तव्यं कणाहिङ्गु ससैन्धवम् ।।
ज्वरमष्टविधं हन्ति वातपित्तकफोद्भवम् । प्लीहानं यकृतं गुल्मं साध्यासाध्यमथापि वा ।।
सन्ततं सतताख्यञ्च विषमज्वरनाशनम् । कामलां पाण्डुरोगञ्च शोथं मेहमरोचकम् ।।
ग्रहणीमामदोषञ्च कासं श्वासं च तत्र च । मूत्रकृच्छ्रातिसारञ्च नाशयेदविकल्पतः ।।
अग्निञ्च कुरुते दीप्तं बलवर्णप्रसादनम् । विषमज्वरान्तकोऽयं धन्वन्तरिप्रकाशितः ।।

(B. R. Jwarādhikāra 5/1141-1148)

Ingredients:

| | | | |
|---|---|---|---|
| 1. Hiṅgulottha pārada | 4 parts | 4. Loha bhasma | 8 parts |
| 2. Śuddha gandhaka | 4 parts | 5. Tāmra bhasma | 8 parts |
| 3. Swarṇa bhasma | 1 part | 6. Abhraka bhasma | 8 parts |

7. Vaṅga bhasma : 2 parts
8. Śuddha gairika : 2 parts
9. Pravāla bhasma : 2 parts
10. Muktā bhasma : 1 part
11. Śaṅkha bhasma : 1 part
12. Śukti bhasma : 1 part and
13. Muktā śukti : in required numbers

Method of preparation:

Hiṅgulottha pārada and śuddha gandhaka are to be taken in a clean khalva yantra and appropriate kajjalī has to be prepared. With this kajjalī rasa parapaṭī is prepared as per classical method using kadalī patra and gomaya.

When all the kajjalī is used to prepare rasa parapaṭī, the prepared rasa parapaṭī is taken again in khalva yantra and triturated to powder form. To this the ingredients from 2 to 12 are added one by one and triturated to homogenous mixture.

This mixture is again triturated for 3 hours with bhūnimba kwātha. This drug material is now filled into muktā śuktis closing them with sandhi-bandhana. All the closed śuktis filled with drug material are placed in a śarāva sampuṭa which is properly sealed with mud and cloth.

After drying this śarāva sampuṭa is subjected to one kukkuṭapuṭa. After it turns cool on its own the drug material inside is collected back into khalva yantra and triturated to store it in airtight glass containers. The medicine will be of ash color with kṣārīya taste and rasāyana gandha.

Dosage, adjuvant and therapeutic utility:

Two rattī (250 mgs) of this medicine is administered once, twice or thrice daily along with pippalī cūrṇa, bhārjita hiṅgu, saindhava lavaṇa to cure all types of jwara, plīha-yakṛt-vṛddhi, gulma, viṣamajwara, kāmlā, pāṇḍu, śotha, prameha, aruci, saṅgrahaṇī, āmadoṣa, śwāsa, kāsa, mūtrakṛcchra and atisāra. It is a known appetizer and improves bala and varṇa of the person.

**29. Rājamṛgāṅka rasa/Mṛgāṅka poṭṭali:**

रसभस्मत्रयो भागा भागैकं हेमभस्मकम् । मृतताम्रस्य भागैकं शिलातालकगन्धकम् ॥
प्रतिभागद्वयं तत्राप्येकीकृत्य निधापयेत् । वराटिका तेन पूर्या च अजाक्षीरेण टङ्कणम् ॥
पिष्ट्वा तेन मुखं रुद्ध्वा मृदो भाण्डे निधापयेत् । शुष्कं गजपुटे पाच्यं चूर्णयेत्स्वाङ्गशीतलम् ॥
रासो राजमृगाङ्कोऽयं चतुर्गुञ्जं क्षयापहम् । दशपिप्पलिकैः क्षौद्रैर्मरीचैरेकविंशकैः ॥
सघृतैर्दापयेद्वातपित्तश्लेष्मोद्भवे क्षये ॥

(B. R. Rājayakṣmādhikāra 14/158-161)

Ingredients:

1. Rasasindūra : 3 parts

2. Swarṇa bhasma : 1 part
3. Tāmra bhasma : 1 part
4. Śuddha manaḥśila : 1 part
5. Śuddha haratāla : 1 part
6. Śuddha gandhaka : 1 part
7. Ajadugdha : As required
8. Varāṭikā (bigger sized) : As required (in numbers)
9. Ṭaṅkaṇa and Ajadugdha : As required
(For preparation of paste to seal the varāṭikās)

Method of preparation:

Rasasindūra is taken in a clean khalva yantra and triturated properly. It is added with śuddha gandhaka and triturated. Now swarṇa bhasma, tāmra bhasma, śuddha manaḥśila and śuddha haratāla are added in desired quantity and again triturated to obtain homogenous mixture.

This mixture is subjected for 3 hours of trituration with ajadugdha and later it is neatly filled into the selected bigger sized cowries (varāṭikā). The mouth of those cowries is sealed with borax (ṭaṅkaṇa) paste prepared by triturating it with required little quantity of ajadugdha.

These filled and sealed cowries are carefully placed in a mud pot of adequate size and the pot is covered with a lid (śarāva) and sealed with mud smeared cloth (mṛtkapaṭita).

This sealed pot is now subjected to one gajapuṭa. When the pot is cool on its own the seal is opened and the cowries are taken out, borax paste is carefully removed and the whole of the cowries with inner filled material are triturated in a clean khalva yantra and the fine powder obtained is stored as end product in airtight glass containers for further therapeutic use. The end product will be whitish powder with alkaline taste and no odour.

Dosage, adjuvant and therapeutic utility:

Four rattī (500 mgs) is added with 10 pippalī chūrṇa + 21 marīca cūrṇa + ghṛta and administered once or twice daily along with honey. It is specially indicated in vātaja, pittaja and kaphaja rājayakṣma. (Original reference: Bṛhat-rasarāja-sundara, Uttara-khaṇḍa)

### 30. Rāmabāṇa rasa:

पारदामृतलवङ्गगन्धकं भागयुग्ममरीचेन मिश्रितम् ।
जातिकाफलमथार्द्धभागिकं तिन्तिडीफलरसेन मर्दितम् ॥

माषमात्रमनुपानयोगतः सद्य एव जठराग्निदीपनः ।
सङ्ग्रहग्रहणिकुम्भकर्णकं सामवातखरदूषणं जयेत् ॥
वन्हिमान्द्यदशवक्त्रनाशनो रामबाण इति विश्रुतो रसः ॥

(B. R. Agnimāndyādirogādhikāra 10/90-92)

Ingredients:

1. Śuddha pārada : 1 part
2. Śuddha vatsanābha cūrṇa : 1 part
3. Lavaṅga cūrṇa : 1 part
4. Śuddha gandhaka : 1 part
5. Marīca cūrṇa : 2 parts
6. Jātīphala cūrṇa : Half part

- Bhāvanā dravya : Ciñcāphala rasa

Method of preparation:

1. Śuddha pārada 2. Śuddha vatsanābha cūrṇa 3. Lavaṅga cūrṇa 4. Śuddha gandhaka—all these drugs are taken 1 part each; 5. Marīca cūrṇa - 2 parts; and 6. Jātīphala cūrṇa - half part; Bhāvanā dravya - Ciñcāphala rasa - 1 bhāvanā; Taking śuddha pārada and śuddha gandhaka in a clean khalva yantra appropriate kajjalī has to be prepared. To it the fine powders of remaining ingredients are added one by one and homogenously mixed. This mixture is subjected to bhāvanā with ciñcāphala rasa to roll the pills of 1 rattī size (125mgs). The pills are dried in shade and stored in airtight glass containers. The pills will be blackish in color with kaṭu-amla rasa and rasāyana gandha.

Its usage with appropriate adjuvant improves the appetite. Its judicious use is like rāma-bāṇa to saṅgrahaṇī of kumbhakarṇa nature (chronic), āmavāta of kharadūṣaṇa nature (very painful), agnimāndya of rāvaṇa nature (severe).

Note: Metaphors like above do not reveal the genuine efficacy of the formulation; instead they may trivialize its significance. Its therapeutic utility needs to be put in analytical data and scientific terminologies before younger generation to make them understand better.

Dosage, adjuvant and therapeutic utility:

One rattī (125 mgs) of the medicine is administered along with uṣṇodaka, ārdraka swarasa or nimbū swarasa to cure saṅgrahaṇī, āmavāta and agnimāndya. (Original reference: Bṛhat-rasarāja-sundara, Uttara-khaṇḍa)

**31. Saptāmṛta lauha:**

मधुकं त्रिफलाचूर्णमयोरजः समं लिहन् । मधुसर्पिर्युतं सम्यग् गव्यं क्षीरं पिबेदनु ॥

छर्दि सतिमिरं शूलमम्लपित्तं ज्वरं क्लमम् । आनाहं मूत्रसङ्गञ्च शोथञ्चैव निहन्ति सः ॥
(B. R. Śūlarogādhikāra 30/125-126)

Ingredients:

1. Yaṣṭīmadhu cūrṇa : 1 part
2. Triphalā cūrṇa : 1 part (each)
3. Loha bhasma : 1 part

Method of preparation:

The fine powders of all the ingredients are taken in a clean khalva yantra and triturated to obtain a homogenous mixture. This mixture is stored in airtight glass containers. The medicine will be reddish black in colour with madhura rasa and characteristic odour.

Dosage, adjuvant and therapeutic utility:

One to 2 gms of the medicine is administered once daily along with honey and ghee taken in unequal ratio; followed by intake of cow's milk. It is beneficial in curing chardi, timira, śūla roga, amlapitta, jwara, klama, ānāha, mūtrasaṅga and śotha. (Original reference: Cakradatta; Śūlaroga cikitsā /21-22)

### 32. Sarvajwarahara lauha:

चित्रकं त्रिफला व्योषं विडङ्गं मुस्तकन्तथा । श्रेयसी पिप्पलीमूलमुशीरं देवदारु च ॥
किराततिक्तकं बालं कटुकी कण्टकारिका । शोभाञ्जनस्य बीजञ्च मधुकं वत्सकं समम् ॥
लौहतुल्यं गृहित्वा तु वटिकां कारयेद्भिषक् । सर्वज्वरहरो लौहः सर्वज्वरकुलान्तकृत् ॥
वातिकं पैत्तिकं श्लेष्मं द्वन्द्वजं सान्निपातिकम् । जीर्णज्वरञ्च विषमं रोगसङ्करमेव च ॥
प्लीहानमग्रमांसञ्च यकृतञ्च विनाशयेत् ॥ (B. R. Jwarādhikāra 5/1149-1152)

Ingredients:

1. Citraka cūrṇa
2. Harītakī cūrṇa
3. Bibhītakī cūrṇa
4. Āmalakī cūrṇa
5. Śuṇṭhī cūrṇa
6. Marīca cūrṇa
7. Pippalī cūrṇa
8. Viḍaṅga cūrṇa
9. Mustā cūrṇa
10. Pipplīmūla cūrṇa
11. Uśīra cūrṇa
12. Devadāru cūrṇa
13. Kirātatikta cūrṇa
14. Sugandhabālā cūrṇa
15. Kaṭukī cūrṇa
16. Kaṇṭakārī cūrṇa
17. Śigru bīja cūrṇa
18. Yaṣṭimadhu cūrṇa
19. Indrayava cūrṇa
20. Gajapippalī cūrṇa
21. Loha bhasma

(all the drugs from 1 to 20 are taken 1 part each and loha bhasma is taken equal to all these drugs i.e. 20 parts.)

Method of preparation:

This mixture is subjected for 1 bhāvanā with jala (water) to roll the pills of 4 rattī (500 mgs) size. The pills are dried in shade and stored in airtight glass containers. The pills will be brownish red in color with tikta rasa and characteristic odour.

Dosage, adjuvant and therapeutic utility:

One pill (500 mgs) is administered once or twice daily along with kirātatikta kwātha to cure all types of jwara. Especially it is indicated in vātaja-pittaja-kaphaja-dvandvaja-sannipātaja-jīrṇa and viṣama jwara. It also cures yakṛt-plīha roga and agramāṁsa (hṛtmāṁsa vṛddhi) roga.

Note: Another two references of 'Sarvajwarahara louha' are found along with above verse in B. R. Jwarādhikāra.

### 33. Śaṅkha vaṭī:

चिञ्चाक्षारपलं पटुवज्रपलं निम्बूरसे कल्कितं
तस्मिञ् शङ्खपलं प्रतप्तमसकृत् संस्थाप्य शीर्णावधि ।।
हिङ्गुव्योषपलं रसामृतवलीन् निक्षिप्य निष्कांशिकान्
वद्ध्वा शङ्खवटी क्षयग्रहणिकारुक्पक्तिशूलादिषु ।। (B. R. Agnimāndyarogādhikāra 10/187)

Ingredients:

| | |
|---|---|
| 1. Ciñcā kṣara | : 1 pala (48 g) |
| 2. Paṭuvajra (pañca lavaṇa) | : 1 pala (48 g) (together) |
| 3. Śaṅkha bhasma | : 1 pala (48 g) |
| 4. Ghṛtabhārjita hiṅgu | : 1 pala (48 g) |
| 5. Śuṇṭhī | : 1 pala (48 g) |
| 6. Marica | : 1 pala (48 g) |
| 7. Pippalī | : 1 pala (48 g) |
| 8. Śuddha pārada | : 1 niṣka (3 g) |
| 9. Śuddha vatsanābha (amṛta) | : 1 niṣka (3 g) |
| 10. Śuddha gandhaka (valī) | : 1 niṣka (3 g) |

- Bhāvanā dravya : Nimbū swarasa

Method of preparation:

Śuddha pārada and śuddha gandhaka are taken in a clean khalva yantra and appropriate kajjalī is prepared. To it the fine powders of remaining ingredients are added one by one and homogenously mixed.

This mixture is subjected to 3 bhāvanās with nimbū swarasa to roll the pills of 2 rattī (250 mgs). The pills are dried in shade and stored in airtight glass containers for further therapeutic use. The pills will be of ash color with lavaṇa-amla rasa and hiṅgu gandha.

Dosage, adjuvant and therapeutic utility:

One pill (250 mgs) is administered twice or thrice daily along with warm water to cure kṣaya roga, grahaṇī roga and has special indication in udaraśūla.

### 34. Śwāsakuṭhāra rasa:

रसं गन्धं विषं टङ्गं शिलोषणकटुत्रिकम् । सर्वं सम्मर्द्य कर्त्तव्यो रसः श्वासकुठारकः ।।
वातश्लेष्मसमुद्भूतं कासं श्वासं स्वरक्षयम् । नाशयेन्नात्र सन्देहो वृक्षमिन्द्राशनिर्यथा ।।

(B. R. Hikkā-śwāsarogādhikāra 16/44-45)

Ingredients:

1. Śuddha pārada : 1 part
2. Śuddha gandhaka : 1 part
3. Śuddha vatsanābha : 1 part
4. Śuddha ṭaṅkaṇa : 1 part
5. Śuddha manaḥśilā : 1 part
6. Śuṇṭhī : 1 part
7. Marīca : 2 parts
8. Pippalī : 1 part

Note: Marīca (uṣaṇa) is taken in double quantity as it is repeated.

Method of preparation:

Śuddha pārada and śuddha gandhaka are taken in a clean khalva yantra and appropriate kajjalī is prepared. To it the fine powders of remaining ingredients are added one by one and triturated properly to obtain a homogenous mixture. The drug mixture is stored in airtight glass containers for further use. The medicine will be ashy in colour with kaṭu rasa and marīca odour.

Dosage, adjuvant and therapeutic utility:

One to 2 rattī (125-250 mgs) of the medicine is administered twice or thrice daily along with ārdraka swarasa, madhu, marīca cūrṇa or warm water. It is useful in śwāsa roga, kāsa roga and śwara-kṣaya.

### 35. Tribhuvanakīrti rasa:

हिङ्गुलं च विषं व्योषं टङ्कणं मागधीशिफाम् । सञ्चूर्ण्य भावयेत् त्रेधा सुरसार्द्रकहेमभिः ।।
रसस्त्रिभुवनकीर्तिर्गुञ्जैकार्द्ररसेन वै । विनाशयेज्ज्वरान् सर्वान् सन्निपातास्त्रयोदश ।।

(B. R. Jwarādhikāra 5/1007-1008)

Ingredients:

1. Śuddha hiṅgula : 1 part
2. Śuddha vatsanābha : 1 part
3. Śuṇṭhī cūrṇa : 1 part
4. Marīca cūrṇa : 1 part
5. Pippalī cūrṇa : 1 part
6. Śuddha ṭaṅkaṇa : 1 part
7. Pippalī mūla : 1 part

Method of preparation:

All the ingredients are taken in a clean khalva yantra and triturated to obtain a homogenous mixture. This mixture is to be subjected for 3 bhāvanās each with tulasī swarasa, ārdraka swarasa and dhattūrapatra swarasa to roll the pills of 1 rattī (125 mgs) pramāṇa.

These pills are dried in shade and stored in suitable airtight glass containers. The pills will be reddish in color with kaṭu rasa and characteristic odour.

Dosage, adjuvant and therapeutic utility:

One pill (125 mgs) is administered once, twice or thrice daily along with any suitable adjuvant to cure all 13 types of sannipāta jwara.

Note: Machine made tablets are largely produced and marketed now-a-days. This formulation is essentially becomes a part of prescription in all acute febrile conditions. Usually non-infectious or viral fevers respond better with its use. (Original reference: Y. R. Pūrvārdha; Jwara cikitsa)

### 36. Vasantakusumākara rasa:

द्विभागं हाटकं चन्द्रं त्रयो वङ्गाहिकान्तका: । चतुर्भागं शुद्धमभ्रं प्रवालं मौक्तिकन्तथा ।।
भावयेद् गव्यदुग्धेन भावनेक्षुरसेन च । वासालाक्षारसोदीच्यरम्भाकन्दप्रसूनकै: ।।
शतपत्ररसेनैव मालत्या: कुसुमेन च । पञ्चान्मृगमदैर्भाव्यं सुसिद्धो रसराड् भवेत् ।।
कुसुमाकर इत्याख्यो वसन्तपदपूर्वक: । गुञ्जाद्वयेन संसेव्य: सिताऽऽज्यमधुसंयुत: ।।
वलीपलितहृन्मेध्य: स्मृतिभ्रंशं विनाशयेत् । तुष्टिदो बलमायुष्यं पुत्रप्रसवकारण: ।।
प्रमेहान् विंशतिञ्चैव क्षयमेकादशं तथा । तथा सोमरुजं हन्ति साध्यासाध्यमथापि वा ।।

(B. R. Prameharogādhikāra 37/114-119)

Ingredients:

| | | |
|---|---|---|
| 1. Swarṇa bhasma | : | 2 parts |
| 2. Rajata bhasma | : | 2 parts |
| 3. Vaṅga bhasma | : | 3 parts |
| 4. Nāga bhasma | : | 3 parts |
| 5. Kāntaloha bhasma | : | 3 parts |
| 6. Abhraka bhasma | : | 4 parts |
| 7. Pravāla bhasma | : | 4 parts |
| 8. Mauktika bhasma | : | 4 parts |
| 9. Kastūrī | : | 4 parts |

- Bhāvanā dravya:

1. Godugdha 2. Ikṣurasa 3. Vāsā swarasa 4. Lākṣā rasa 5. Udīcya kwātha 6. Kadalīkanda swarasa 7. Kamalapuṣpa rasa and 8. Campā puṣpa rasa.

Method of preparation:

First eight bhasmas are taken in a clean khalva yantra and triturate to get a homogenous mixture. Now the mixture is subjected to 1 bhāvanā each (for a day) with eight above mentioned bhāvanā dravya simultaneously for eight days.

The kastūrī is dissolved in required quantity of 'gulāba jala' and the liquid is used to triturate the drug mass for another day to roll the pills of 2 rattī (250 mgs) size. The pills are dried in shade and stored in airtight glass containers. The pills will be brownish red in color with tikta-madhura rasa and kastūrī odour.

Dosage, adjuvant and therapeutic utility:

One pill (250 mgs) is administered along with honey and ghee taken in unequal ratio added with sugar. It is useful in prameha roga. Its regular use provides good radiance, virility and strength. It cures vali-palita roga and loss of memory (smṛti-bhraṁśa).

It is medhya (memory enhancer), āyuṣya (improves quality of life), balya (strengthening), and putrotpādaka (encourages healthy conception). It is useful in all 20 types of prameha roga, 11 types of kṣaya roga, somaroga of poor prognosis.

### 37. Vātavidhwaṁsana rasa:

सूतमभ्रकसत्त्वञ्च कांस्यं शुद्धञ्च माक्षिकम् । गन्धकं तालकं सर्वं भागोत्तरविवर्द्धितम् ॥
कज्जलीकृत्य तत्सर्वं वातारिस्नेहसंयुतम् । सप्ताहं मर्दयित्वा तु गोलकीकृत्य यत्नतः ॥
निम्बुद्रवेण संपीड्य तिलकल्केन लेपयेत् । अर्द्धाङ्गुलदलेनैव परिशोष्य प्रयत्नतः ॥
प्रपचेद् वालुकायन्त्रे द्वादशप्रहरं ततः । जठरस्य रुजः सर्वास्तथा च मलविग्रहम् ॥
आध्मानकं तथाऽऽनाहं विसूचीं वह्निमान्द्यकम् । आमदोषमशेषञ्च गुल्मं छर्दिञ्च दुर्जयाम् ॥
ग्रहणीं श्वासकासौ च कृमिरोगं विशेषतः । हन्यात् सर्वाङ्गशूलञ्च मन्यास्तम्भं तथैव च ॥
ज्वरे चैवातिसारे च शूलरोगे त्रिदोषजे । पथ्यं रोगानुसारेण देयमस्मिन् भिषग्वरैः ।
कथितो नन्दिनाथेन वातविध्वंसनो रसः ॥

(R. Sā. San. 2/59-65)

Ingredients:

1. Śuddha pārada : 1 part
2. Abhraka bhasma : 2 parts
3. Kāṁsya bhasma : 3 parts
4. Swarṇa mākṣika bhasma : 4 parts
5. Śuddha gandhaka : 5 parts
6. Śuddha haratāla : 6 parts

all these drugs are taken in specified ratio.

Method of preparation:

Śuddha pārada and śuddha gandhaka are to be taken in a clean khalva yantra and appropriate kajjali has to be prepared. This kajjalī is triturated with required quantity of 'eraṇḍa taila' for 7 days. Later it is triturated for a day with 'nimbū swarasa' to obtain the mixture in kalka form.

This kalka is enclosed in a śarāva sampuṭa which is half aṅgula thick. This sampuṭa is firmly placed in 'vālukā yantra' and subjected for intense heat of 12 prahara (36 hours). When self-cool, the medicine inside is collected and stored in airtight glass containers.

Dosage, adjuvant and therapeutic utility:

One to two rattī (125 to250 mgs) of this medicine is administered once, twice or thrice daily along with suitable adjuvant. It is indicated in abdominal disorders, constipation, ādhmāna, ānāha, visūcikā, agnimāndya, āmadoṣa, gulmaroga, chardi, grahaṇī roga, śwāsa, kāsa, krimiroga, sarvāṅga-śūla, manyāsthambha, jwara, atisāra and tridoṣaja śūla.

The pathya (diet) has to be decided depending on the disease condition. This medicine was formulated by a seer named 'Nityanātha'.

**38. Yogendra rasa:**

> विशुद्धं रससिन्दूरं तदर्द्धं शुद्धहाटकम् । तत्समं कान्तलौहञ्च तत्समं चाभ्रमेव च ।।
> विशुद्धं मौक्तिकं चैव वङ्गञ्च तत्समं मतम् । कुमारिकारसैर्भाव्यं धान्यराशौ दिनत्रयम् ।
> ततो रक्तिद्वयमितां वटीं कुर्याद्विचक्षणः ।। योगवाही रसो ह्येष सर्वरोगकुलान्तकृत् ।।
> वातपित्तभवान् रोगान् प्रमेहान् बहुमूत्रताम् । मूत्राघातमपस्मारं भगन्दरगुदामयान् ।।
> मूर्च्छोन्मादञ्च यक्ष्माणं पक्षाघातं हतेन्द्रियम् । शूलाम्लपित्तकं हन्ति भास्करस्तिमिरं तथा ।।
> त्रिफलारसयोगेन शुभ्रया सितयाऽपि वा । भक्षयित्वा भवेद्रोगी कामरूपी सुदर्शनः ।।
> रात्रौ सेव्यं गवां क्षीरं कृशानाञ्च विशेषतः । योगेन्द्राख्यो रसो नाम्ना कृष्णात्रेयेण भाषितः ।।

(B. R. Vātavyādhirogādhikāra 26/156-162)

Ingredients:

1. Rasasindūra : 2 parts
2. Svarṇa bhasma : 1 part
3. Kāntaloha bhasma : 1 part
4. Abhraka bhasma : 1 part
5. Muktā bhasma : 1 part
6. Vaṅga bhasma : 1 part

- Bhāvanā dravya : Kumārī swarasa

Method of preparation:

Rasasindūra is taken in a clean khalva yantra and triturated for a while. To it the remaining bhasmas are added one by one and carefully triturated to obtain a homogenous mixture.

This mixture is now subjected to 1 bhāvanā with 'ghṛtakumārī swarasa' and a bolus of the drug material is prepared. The bolus is properly covered with eraṇḍa patra (leaves of castor oil plant), tied with thread and kept deep inside the 'dhānya rāśi' (heap of grains) for 3 days. On 4th day the drug bolus is taken out and the drug material is triturated again with 'ghṛtakumārī swarasa' to roll the pills of 2 rattī (250 mgs). The pills are dried in shade and stored in airtight glass containers. The pills will be reddish in colour with tikta rasa and rasāyanagandha.

Dosage, adjuvant and therapeutic utility:

One pill (250 mgs) is administered once or twice daily along with triphalā kvātha, vaṁśalocana and śarkarā. This medicine is a yogavāhī; with different adjuvants, this medicine can cure all the disease conditions. It is useful in the diseases of vāta and pitta doṣa. It cures all vātavyādhi, prameha, bahumūtratā, mūtrāghāta, apasmāra, bhagandhara, arśa, mūrcchā, unmāda, rājayakṣmā, pakṣāghāta, impairment of sense organs, śūla and amlapitta.

Its regular use brings in health and radiance of kāmadeva (a mythological character). It has to be consumed by physically weak persons during night time along with milk. Ācārya Kṛṣṇātreya was the first person who explained this formulation.

## (II) PARPAṬĪ RASĀYANA

### 1. Bola parpaṭī:

सूतगन्धकसुकज्जलिकायाः पर्पटी समयुता समभागम् ।
बोलचूर्णविहितं प्रतिवाप्यं स्याद्रसोऽयमसृगामयहारी ॥
वल्लयुग्मयुगलं प्रतिदेयं शर्करामधुयुतः किल दत्तः ।
रक्तपित्तगुदजस्रुतियोनिस्त्रावमाशु विनिवारयतीशः ॥

(Y. R. Pūrvārdha; Raktapittacikitsā; Rasayoga)

Ingredients:

1. Śuddha pārada : 1 part
2. Śuddha gandhaka : 1 part
3. Śuddha bola cūrṇa : 2 parts

Method of preparation:

Taking śuddha pārada and śuddha gandhaka in a clean khalva yantra, appropriate kajjalī is prepared. It is added with equal quantity of śuddha bola chūrṇa (niryāsa of plant 'Commiphora myrrha') and triturated properly. This bola mixed kajjalī is used to prepare parpaṭī as per classical method.

The product black flakes obtained are dried, powdered and stored in an airtight glass container for further therapeutic use.

Note: Ambiguity surrounds the drug 'bola' used in this formulation. It is meant as, rakta bola, kṛṣṇa bola or hīrā bola in many books, but clear explanation about the drug is not available. The drug used by pharmaceutical companies in the name of bola is gummy exudates of plant 'Commiphora myrrha'— a herbal resin which comes in granular form.

Use of this drug in the name of 'bola' seems appropriate as this drug belonging to Burseraceae family possesses raktasthambana property which is required in this compound formulation.

The gummy exudates of the plant 'Commiphora myrrha' is purified by anubūta method. The drug is dissolved in required quantity of hot water and later filtered through a clean cloth. The filtrate is dried under sun and the solidified drug material is powdered and used.

Dosage, adjuvant and therapeutic utility:

Three to six rattī (375 to 750 mgs) is administered in divided doses per day along with sugar or honey. It is useful in raktapitta, arśas and yonisrāva.

### 2. Loha parpaṭī:

समौ गन्धरसौ कृत्वा कज्जलीकृत्य यत्नतः । शुद्धलौहस्य चूर्णन्तु रसतुल्यं प्रदापयेत् ।।
एकीकृत्य ततो यत्नाल्लौहपात्रे प्रमर्दितम् । घृतप्रलिप्तदर्व्यान्तु स्वेदयेन्मृदुनाऽग्निना ।।
द्रवीभूतं समाहृत्य ढालयेत् कदलीदले । चूर्णीकृत्य सुखार्थाय पथ्यभुग्भिः प्रसेव्यते ।।
शीतोदकानुपानं वा क्वाथो वा धान्यजीरयोः । लौहेन पर्पटी ह्येषा भक्ष्या लोकस्य सिद्धिदा ।।
रक्तिकैकां समारभ्य वर्द्धयेद्रक्तिकां क्रमात् । सप्ताहं वा द्वयं वाऽपि यावदारोग्यदर्शनम् ।।
सूतिकाञ्च ज्वरांश्चैव ग्रहणीमतिदुस्तराम् । आमशूलातिसारांश्च पाण्डुरोगं सकामलं ।।
प्लीहानमग्निमान्द्यञ्च भस्मकञ्च तथैव च । आमवातमुदावर्त्तं कुष्ठान्यष्टादशैव तु ।।
एवमादींस्तथा रोगान् गराणि विविधानि च ।। हन्त्यनेन प्रयोगेण वपुष्मान् निर्मलः सुखी ।
जीवेद्वर्षशतं पूर्णं वलीपलितवर्जितः । भोजनं रक्तशालीनां त्यक्त्वा शाकं विदाहि च ।।
आतपं वातकोपञ्च चिन्तनं मैथुनं तथा । प्रातरुत्थाय संसेव्या विधिनाऽऽयुःप्रवर्द्धिनी ।।

(B. R. Grahaṇīrogādhikāra 8/444-453)

Ingredients:

| | | | |
|---|---|---|---|
| 1. Śuddha pārada | : 1 part | 3. Loha bhasma | : 1 part |
| 2. Śuddha gandhaka | : 1 part | | |

Method of preparation:

Appropriate kajjalī is prepared using śuddha pārada and śuddha gandhaka. The kajjalī is added with mentioned quantity of loha bhasma and triturated homogenously.

Now this drug mixture is used to prepare parpaṭī as per classical method. The end product in the form of parpaṭī is triturated in a clean khalva yantra and the obtained black fine powder is stored in an airtight glass container for further therapeutic use.

Dosage, adjuvant and therapeutic utility:

It is started with 1 rattī (125 mgs) and increased 1 rattī on each day for one week (875 mgs on 7th day) or two weeks (1750 mgs on 14th day) along with hima or kwātha of dhānyaka or jīraka.

It is useful in sūtikāroga, jwara, asādhya grahaṇī, āmadoṣaja śūla, atisāra, pāṇḍu, kāmalā, plīhāvṛddhi, agnimāndya, bhasmaka roga, āmavāta, udāvarta, all types of kuṣṭha, sthāvara and jāṅgama viṣa. Person attains 100 years of healthy life.

Pathyāpathya: Rakta śālī is advised here for food. The person has to avoid śākavarga, vidāhī dravya; vāta-ātapa sevana, cintā and maithuna during medication. The medicine has to be consumed on empty stomach, early in the morning after bathroom routine for better effect.

Note: Another preparation of the same name is found in R. Yo. Sā. II part preparation number 281.

### 3. Gagana/Vyoma parpaṭī:

गगनवलिरसेन्द्रं मर्दितं गोघृताक्तं सममथबदराग्नौ प्रद्रुतं लोहपात्रे ।
निहितकदलिपत्रे पातयेद्गोमयेऽथ तदुपरि दलमूर्ध्नि गोमयञ्चाथ देयम् ।।
भवति गगननाम्ना पर्पटीसूतकोऽयं जरणमधुसमेतं चास्य वल्लं प्रदद्यात् ।
अतिसृतिगदमुग्रं षड्विधं हन्ति शीघ्रं श्वयथुमपि कफोत्थं त्र्युषणै र्युक्तसूतः ।।

(R. Y. Sā: I part; 'ga'kārādi rasa: preparation no 37

Ingredients:

| | | |
|---|---|---|
| 1. Abhraka bhasma (Gagana) | : | 1 part |
| 2. Śuddha gandhaka (Vali) | : | 1 part |
| 3. Śuddha pārada | : | 1 part |

Method of preparation:

Appropriate kajjalī is prepared using śuddha pārada and śuddha gandhaka. The kajjalī is added with equal quantity of abhraka bhasma and triturated homogenously.

Now this drug mixture is used to prepare parpaṭī as per classical method. The end product in the form of parpaṭī is triturated in a clean khalva yantra to fine.

black coloured powder form and stored in an airtight glass container for further therapeutic use.

Dosage, adjuvant and therapeutic utility:

One valla (3 rattī = 375 mgs) of the medicine is administered along with jīraka, madhu and trikaṭu. It is useful in all types of atisāra if consumed with jīrā and madhu; it cures kaphaja śotha if consumed with trikaṭu.

### 4. Pañcāmṛta parpaṭī:

> अष्टौ गन्धकतोलका रसदलं लौहं तदर्द्धं शुभं लोहार्द्धञ्च वराभ्रकं सुविमलं ताम्रं तदभ्रार्द्धकम् ।।
> पात्रे लौहमये च मर्दनविधौ चूर्णीकृतञ्चैकतोदर्व्या वादरवन्हिनाऽतिमृदुना पाकं विदित्वा दले ।।
> रम्भाया लघु ढालयेत् पटुरियं पञ्चामृता पर्पटी ख्याता क्षौद्रघृतान्विता प्रतिदिनं गुञ्जाद्वयम् वृद्धितः ।
> लौहे मर्दनयोगतः सुविमलं भक्ष्यक्रिया लौहवत् गुञ्जाष्टावथवा त्रिकं त्रिगुणितं सप्ताहमेवं भजेत् ।।
> नानावर्णग्रहण्यामरुचिसमुदये दुष्टदुर्नामकादौ । छर्द्यां दीर्घातिसारे ज्वरभरकलिते रक्तपित्ते क्षयेऽपि ।।
> वृष्याणां वृष्यराज्ञी वलिपलितहरा नेत्ररोगैकहन्त्री। तुन्दं दीप्तं स्थिराग्निं पुनरपि नवकं रोगिदेहं करोति ।।
> (B. R. Grahaṇīrogādhikāra 8/458 - 460)

Ingredients:

1. Śuddha gandhaka : 16 parts
2. Śuddha pārada : 8 parts
3. Loha bhasma : 4 parts
4. Abhraka bhasma : 2 parts
5. Tāmra bhasma : 1 part

Method of preparation:

Appropriate kajjalī is prepared using śuddha pārada and śuddha gandhaka. The kajjalī is added with mentioned quantity of loha bhasma, abhraka bhasma and tāmra bhasma and triturated homogenously.

Now this drug mixture is used to prepare parpaṭī as per classical method. The end product in the form of parpaṭī is triturated in a clean khalva yantra and the obtained fine powder is stored in an airtight glass container for further therapeutic use. The medicine will be black in color with no taste and characteristic odour.

Dosage, adjuvant and therapeutic utility:

Two rattī to 8 rattī is administered by daily increasing 2 rattī or as kalpaprayoga for 21 days along with madhu and ghṛta or any adjuvant as per the disease condition.

It is useful in all types of grahaṇīroga, aruci, duṣṭa arśa, chardi, purāṇa atisāra, jwara, raktapitta and kṣayaroga. It is known vṛṣya. It is also useful in vali, palitaroga, netraroga, sthaulya. It is good agnidīpaka and induces new energy into the body.

Note: The same preparation is also found in R. Yo. Sā. II part; preparation numbers 43 (prathama); other preparations of the same name are found in R. Yo. Sā. II part; preparation numbers 44, 45, 46, 47, 48, 49, 50, 51 (from dvitīya to navamī).

### 5. Rasa parpaṭī:

सूतं हिङ्गुलसंभवं हतमलं मोटोरुवूकार्द्रकैः
दैत्येन्द्रं कचरञ्चनोद्भवजलैः प्राक् सप्तधा भावितम् ।
अग्नौकोलककोकिलोज्ज्वलशिखे सम्यग्विलाप्य द्रुतं
भृङ्गोत्थे सलिले निषिच्य विमलं तुल्यं ततः पेषयेत् ।।
युक्त्या कज्जलिकाम् विधाय विबुधस्तां लोहदर्व्यां क्षिपेत्
निर्दिष्टैः खलु कोकिलैश्च दहनं प्रज्वाल्य दर्वी न्यसेत् ।
सूतं पङ्कसमं विलाप्य रुचिरं पाकक्रियाकोविदः
शीघ्रं गोमयसंस्थिते तु कदलीपत्रे ततो निक्षिपेत् ।।
निक्षिप्तमात्रं कदलीपलाशैराच्छादयेद्वै सुचिरं रसज्ञः ।
यस्मादियं पर्पटतुल्यरूपा तस्मान्मता पर्पटिकाभिधेया ।। (R. T. 6/135-137)

Hiṅgulottha pārada is triturated one day each with 'araṇī kwātha', 'eraṇḍamūla kwātha' and 'ārdraka swarasa' for 3 days. It is later washed and taken. Concurrently, 'śuddha gandhaka' is subjected for 7 bhāvanās with 'Bhṛṅgarāja swarasa' and dried. Later it is taken in an iron vessel, melted over the glowing charcoal of 'badara wood' and poured into a vessel containing 'Bhṛṅgarāja swarasa'.

Śuddha pārada and śuddha gandhaka, processed as said above are taken in a clean khalva yantra in equal ratio. The mixture triturated thoroughly to obtain appropriate kajjalī.

Meanwhile the banana leaf's mid rib has to be removed and it has to be cut into pieces of roughly around one square feet size. These pieces are applied with little amount of ghee and held for few seconds over fire. By doing this the leaf becomes tensile and do not tear off that easily during the process.

At the same time the 2 to 3 kgs of cow dung has to be placed on a plane surface of one square feet near the oven with even upper surface. Over this one piece of kadalī leaf has to be firmly spread. Over the upper surface of the leaf little more ghee has to be smeared.

The remaining cow dung has to be taken in a wider piece of banana leaf and a firm poṭṭalī has to be tied. The base of the 'gomaya poṭṭalī' is also smeared with little ghee and kept ready.

Now, around 10 to 15 gms of this kajjalī is taken at once in a ghee smeared stainless steel or iron table spoon and heated over glowing charcoal to melt it. When the kajjalī starts to melt, it has to be continuously stirred by the smaller spoon and when it attains wet paste like form, it has to totally collected and poured over the ghṛtalipta kadalī patra placed over cow dung.

Soon the paste has to be pressed for a minute with the base of 'gomaya poṭṭalī' with downward and forward force. As a result the drug material attains thin wafer (pāpaḍa) shape.

The sandwiched wafer is later carefully collected, tested for the perfectness and stored in airtight container. The parpaṭī obtained will be black with shiny exterior, with thin layer of ghee and imprints of kadalī patra on both the sides. This is called 'rasa parpaṭī'.

Note: Little quantity of ghee is smeared in the iron or stainless steel 'table spoon' taken to melt sulphur. This ghee prevents sticking of molten kajjalī to the spoon and also prevents burning of sulphur because of the heat applied. Ghee applied on the banana leaves also prevents the burning of the leaves and acts as lubricant to give perfect shape to parpaṭī.

Dosage, adjuvant and therapeutic utility:

Two rattī to 8 rattī is administered by daily increasing 2 rattī or as kalpa-prayoga for 21 days along with takra, saindhava lavaṇa, jīraka, madhu (honey), navanīta (butter) or any adjuvant as per the disease condition. It is claimed to effective all most all the diseases from childhood to old age.

Note: Another preparation of the same name is found in B. R. Grahaṇīrogādhikāra 8/402-443. It is also found in R. Yo. Sā. II part; preparation no 71, 72, 73, 74, 75, 76, 77, 78 (from prathama to aṣṭama).

### 6. Śweta parpaṭī:

कर्षविंशतिमानः स्यात्सूर्यक्षारश्च शोभनः । स्फटिका पञ्चकर्षा स्यादपक्वा पाण्डुरा शुभा ।।
टङ्कणो नव्यसारश्च कर्पूरं च पृथर् पृथर् । त्रिकर्षप्रमितं ग्राह्यं सर्वमेकत्र कारयेत् ।।
द्रावयित्वा मृत्तिकायाः पात्रे तत्कदलेदले । ऊर्द्धाधो गोमयं दत्वा ढालयेत् स्वाङ्गशीतलम् ।।
मर्दयेत् कूपिकामध्ये स्थापयेत्तदनन्तरम् । दशगुञ्जामात्रयेयं देया दुग्धजलैः सह ।
मूत्राघातं मूत्रकृच्छ्रं मूत्रदाहंनिवारयेत् ।।

(Rasoddhāra Tantra; Mūtrakṛcera)

Ingredients:

1. Sūrya kṣāra : 20 parts
2. Sphaṭika : 5 parts

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3. Ṭaṅkaṇa : 3 parts
4. Navasādara : 3 parts
5. Karpūra : 3 parts

Method of preparation:

Excepting karpūra all the other ingredients are taken in a mud śarāva and heated over mild fire to melt them. When whole drug mass is liquefied, the śarāva is taken out from fire and karpūra is added in specified quantity which melts into it on its own.

Now this liquid drug mixture is used to prepare parpaṭī as per classical method. The end product in the form of parpaṭī is stored in an airtight glass container for further therapeutic use.

Practical difficulty: This formulation if done as per classical method, there will be chances that the ghee smeared kadalī patra burns soon after pouring the liquefied drug material.

Practical point: Deviating from the classical method, the molten drug mixture is usually hurled on to a clean, soft and even stony surface in large scale preparations and later collected back in the form of flakes as it cools down.

Note: Here mud śarāva is used instead of any metallic vessel to melt the ingredients. This is done with the intention of preventing any possible reaction of the kṣārīya dravya. If any metallic vessel if used in the process, there are chances that the drug gets reacted with the vessel.

Dosage, adjuvant and therapeutic utility:

One to 10 rattī (125 mgs to 1.25 gms) is used as kalpa-prayoga along with milk and water. It is useful in mūtrāghāta, mūtrakṛcchra and mūtradāha.

### 7. Śweta parpaṭī:

(Rasatantrasāra and Siddha Prayogasaṅgraha)

Ingredients:

1. Sūryakṣāra : 1 part
2. Sphaṭika : 1/8th part
3. Navasādara : 1/16th part

Method of preparation:

All the ingredients are powdered in a clean khalva yantra. The mixture is taken in a mud śarāva. The mixture is heated with moderate fire until all the drug material melts. This molten liquid is soon hurled on to a clean, soft and even stony surface.

dr.keshav_raj

As it cools down, the flakes are collected as end product and are stored in an airtight glass container for further therapeutic use. The product will be white coloured with 'kṣārīya' rasa and characteristic odour.

Note: Here mud śarāva is used instead of any metallic vessel to melt the ingredients. This is done with the intention of preventing any possible reaction of the kṣārīya dravya with the vessel.

Dosage, adjuvant and therapeutic utility:

One to 10 rattī (125 mgs to 1.25 gms) is used as kalpa-prayoga along with water, tender coconut, sugarcane juice, milk with sugar or any mūtrala kaṣāya. It is claimed to be an effective mūtrala, swedala, vātānulomaka. It is useful in mūtrakṛcchra, aśmarī and mūtrāghāta.

### 8. Swarṇa parpaṭī:

रसोत्तमं पलं शुद्धं हेमतोलकसंयुतम् । शिलायां मर्दयेत्तावद्यावदेकत्वमागतम् ।।
गन्धकस्य पलञ्चैकमयः पात्रे ततो दृढे । मर्दयेद् दृढपाणिभ्यां यावत्कज्जलतां व्रजेत् ।।
ततः पाकविधानज्ञः पर्पटीं कारयेत् सुधीः । रक्तिकादिक्रमेणैव योजयेदनुपानतः ।।
ग्रहणीं विविधां हन्ति यक्ष्माणञ्चविशेषतः । शूलमष्टविधं हन्ति वृष्या सर्वरुजाऽपहा ।।

(B. R. Grahaṇīrogādhikāra 8/454-457)

Ingredients:

1. Śuddha pārada : 4 parts
2. Svarṇa bhasma : 1 part
3. Śuddha gandhaka : 4 parts

Method of preparation:

Appropriate kajjalī is prepared using śuddha pārada and śuddha gandhaka. The kajjalī is added with mentioned quantity of svarṇa bhasma and triturated homogenously.

Now this drug mixture is used to prepare parpaṭī as per classical method. The end product in the form of parpaṭī is triturated in a clean khalva yantra and the black coloured, tasteless powder obtained stored in an airtight glass container for further therapeutic use.

Dosage, adjuvant and therapeutic utility:

One rattī (125 mgs) to seven rattī (875 mgs) is used as kalpa-prayoga for a week along with suitbale adjuvant. It is claimed to effective in all types of grahaṇī, rājayakṣma and all types of śūla; it is known vṛṣya.

Note: Other preparations of the same name are found in R. Yo. Sā. II part;

preparation no 430, 431, 432, 433 (from prathama to caturtha); Y. R. Grahaṇīcikitsā; Rasayoga.

### 9. Tāmra parpaṭī:

रसगन्धकताम्राणां चूर्णं कृत्वा समांशकम् । पुटपाकविधौ पक्त्वा मधुनाऽऽलोड्य संल्लिहेत् ।।
सर्वरोगहरञ्चैतत्पर्पटाख्यं रसायनम् ।।

(R. Y. S. I part; Takārādi rasa; preparation no 16; tṛtīya)

Ingredients:

1. Śuddha pārada : 1 part
2. Śuddha gandhaka : 1 part
3. Śuddha tāmra : 1 part

Method of preparation:

Appropriate kajjalī is prepared using śuddha pārada and śuddha gandhaka. The kajjalī is added with mentioned quantity of tāmra bhasma and triturated homogenously.

Now this drug mixture is used to prepare parpaṭī as per classical method. The end product in the form of parpaṭī is triturated in a clean khalva yantra and obtained black coloured powder is stored in an airtight glass container for further therapeutic use.

Dosage, adjuvant and therapeutic utility:

One to two rattī (125-250 mgs) is administered along with honey or any suitbale adjuvant. It is claimed to effective rasāyana and is indicated in all the diseases.

Note: Other preparations of the same name are found in R. Yo. Sā; I part; preparation no 14, 15, 17 (prathama, dvitīya and caturtha respectively).

Market availability:

Presently no pharmaceutical company markets this product.

### 10. Vijaya parpaṭī:

रसं वज्रं हेमं तारं मौक्तिकं ताम्रमभ्रकम् । सर्वतुल्येन गन्धेन कुर्याद्विजयपर्पटीम् ।।
दुर्वारां ग्रहणीं हन्ति दुःसाध्यां बहुवार्षिकीम् । आमशूलमतीसारं चिरोत्थमतिदारुणम् ।।
प्रवाहिकां षडर्शांसि यक्ष्माणं सपरिग्रहम् । शोथञ्च कामलां पाण्डुं प्लीहगुल्मजलोदरम् ।।
पित्तशूलमम्लपित्तं वातरक्तं वमिं भ्रमिम् । अष्टादशविधान् कुष्ठान् प्रमेहान् विषमज्वरान् ।।
चतुर्विधमजीर्णञ्च मन्दाग्नित्वमरोचकम् । जीर्णेऽपि पर्पटीं कुर्वन् वपुषा निर्मलः सुधीः ।।
जीवेद्वर्षशतं श्रीमान् वलीपलितवर्जितः ।।
प्रातः करोति सततं नियतं द्विगुञ्जां यस्तां स विन्दति तुलां कुसुमायुधस्य ।
आयुश्च दीर्घमनघं वपुषःस्थिरत्वं हानिं वलीपलितयोस्तुलं बलञ्च ।।

(B. R. Grahaṇīrogādhikāra 8/485-492)

Ingredients:

1. Śuddha pārada : 1 part
2. Vajra bhasma : 1 part
3. Swarṇa bhasma : 1 part
4. Rajata bhasma : 1 part
5. Muktā bhasma : 1 part
6. Tāmra bhasma : 1 part
7. Abhraka bhasma : 1 part
8. Śuddha gandhaka : 7 parts

Method of preparation:

Appropriate kajjalī is prepared using mentioned ratio of śuddha pārada and śuddha gandhaka. The kajjalī is added with mentioned quantity of vajra bhasma, svarṇa bhasma, rajata bhasma, muktā bhasma, tāmra bhasma, abhraka bhasma and triturated homogenously.

Now this drug mixture is used to prepare parpaṭī as per classical method. The end product in the form of parpaṭī is triturated in a clean khalva yantra and stored in an airtight glass container for further therapeutic use. The product will be a black, tasteless powder with characteristic odour.

Dosage, adjuvant and therapeutic utility:

One to two guñjā (125 to 250 mgs) of this medicine can be administered per day in divided doses along with suitable adjuvant. It is indicated in grahaṇī, āmaśūla, atisāra, pravāhikā, all types of arśa, yakṣma, śotha, kāmalā, pāṇḍu, plīha, gulma, jalodara, pittja śūla, amlapitta, vātarakta, chardi, bhrama, all types of kuṣṭha, all types of prameha, viṣamajwara, all types of ajīrṇa, agnimāndya and aruci.

This preparation is indicated in wide range of disease conditions as mentioned above. An aged person consuming this medicine attains good physical and mental health. He combats aging process and old age diseases quite effectively.

He attains disease free life of 100 years (as per the last two lines of the verse). The person who consumes 2 rattī (250 mgs) of this medication daily morning attains an excellent physical and mental health conditions.

Note: Another preparation the same preparations are found in R. Yo. Sā; II part; preparation no 500 and 501 (prathama and dvitīya);

**References for few other parpaṭī yoga:**

1. Abhraka parpaṭī : R. Y. S; I part; 'a' kārādi rasa; prep no 140,141;
2. Aṣṭāmṛta parpaṭī : Rasoddhāra Tantra; Śūlarogādhikāra;
3. Hema parpaṭī : Rasaprakāśa-sudhākara 8/177-181;

| | | |
|---|---|---|
| 4. | Maṇḍūra parpaṭī | Siddhayoga Saṇgraha; Grahaṇīrogādhikāra; |
| 5. | Maṇi parpaṭī | R. R. S; Nāsāroga; 24/20-23; |
| 6. | Muktā parpaṭī | Rasoddhāra Tantra; Amlapittarogādhikāra; |
| 7. | Praṇādā parpaṭī | R. Y. S; II part; 'pa' kārādi rasa; prep no 317; |
| 8. | Ratna parpaṭī | Rasoddhāra Tantra; Rājayakṣmarogādhikāra; |
| 9. | Saptāmṛta parpaṭī | Rasoddhāra Tantra; Rājayakṣmarogādhikāra; |
| 10. | Sarveśvara parpaṭī | R. R. S; Vidradhi; 18/2-16. |
| 11. | Siddhanāthī kāñcana parpaṭī | Rasoddhāra Tantra; Saṅgrahaṇīrogādhikāra; |
| 12. | Sudhā parpaṭī | Rasoddhāra Tantra; Raktapittarogādhikāra; |

## (III) POṬṬALĪ RASĀYANA

### 1. Hemagarbhapoṭṭali rasa:

रसभस्म त्रयो भागा भागैकं हेमभस्मकम् । मृतताम्रस्य भागैकं भागैकं गन्धकस्य च ॥
मर्दयेच्चित्रक द्रावैर्द्वियामान्ते समुद्धरेत् । पूर्यां वराटिका तेन टङ्कणेन विलेपयेत् ॥
वराटीं पूरयेद्भाण्डे रुद्ध्वा गजपुटे पचेत् । विचूर्णयेत्स्वाङ्गशीतं पोट्टलीं हेमगर्भिकाम् ॥
मृगाङ्कवच्च गुञ्जैकाभक्षणाद् राजयक्ष्मनुत् ॥ (B. R. Rājayakṣmādhikāra 14/186-188)

Ingredients:

| | | |
|---|---|---|
| 1. | Rasasindūra | 3 parts |
| 2. | Swarṇa bhasma | 1 part |
| 3. | Tāmra bhasma | 1 part |
| 4. | Śuddha gandhaka | 1 part |
| • | Bhāvanā dravya | Citraka mūla kwātha; |

• Other requirements:

| | | |
|---|---|---|
| 5. | Varāṭikā (bigger sized) | As required (in numbers); and |
| 6. | Ṭaṅkaṇa | As required (for preparation of paste to seal the varāṭikās); |

Method of preparation:

Rasasindūra is taken in a clean khalva yantra and triturated properly. It is added with śuddha gandhaka and triturated. Now swarṇa bhasma and tāmra bhasma are added and again triturated to obtain homogenous mixture.

This mixture is subjected for 6 hours of trituration with citraka mūla kwātha and neatly filled into the selected bigger sized cowries (varāṭikā) and the mouth of those cowries is sealed with borax (ṭaṅkaṇa) paste prepared by triturating it with required little quantity of water.

These filled and sealed cowries are carefully placed in a mud pot of adequate size and the pot is covered with a lid (śarāva) and sealed with mud smeared cloth (mṛtkapaṭita).

This sealed pot is now subjected to one gajapuṭa heat. When the pot is cool on its own the seal is opened and the cowries are taken out, borax paste is carefully removed and the whole of the cowries with inner filled material is triturated in a clean khalva yantra and the fine powder obtained is stored as end product in airtight glass containers for further therapeutic use.

As the above verse quotes, this hemagarbha poṭṭalī rasa is given in dosage of 1 rattī (125 mgs) as that of mṛgāṅka rasa in rājayakṣma. The end product will be whitish powder with alkaline taste and no odour.

Dosage, adjuvant and therapeutic utility:

One rattī (125 mgs) of the medicine is administered along with madhu or pippalī cūrṇa to cure rājayakṣma roga.

Note: Other references for hemagarbha poṭṭalī rasa are found in; Śā. Ma. Kha. 12/97-103; Śā. Ma. Kha. 12/107-113; and Y. R. Kāsacikitsā.

**References for few other poṭṭalī yoga:**

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|---|---|
| 1. Hiraṇyagarbha poṭṭalī rasa | : R. Y. S; II part; 'ha' kāra rasa; preparation no 634; |
| 2. Lokanātha rasa | : B. R. Atisārādhikāra 7/139-141; |
| 3. Mallagarbha poṭṭalī rasa | : R. Y. S: II part; Poṭṭalīrahasyam; page 581; |
| 4. Mṛgāṅka poṭṭalī | : B. R. Rājayakṣmādhikāra 14/158-161; |
| 5. Rasagarbha poṭṭalī rasa | : R. Y. S: II part; Poṭṭalīrahasyam; 'dvitīya': page 582; |
| 6. Ratnagarbha poṭṭalī rasa | : B. R. Rājayakṣmādhikāra 14/180-185; |
| 7. Śaṅkhagarbha poṭṭalī rasa | : R. Y. S: II part; 'Śa' kārādi rasa; preparation no 11. |

## (IV) KŪPIPAKWA RASĀYANA

### 1. Makaradhwaja rasa:

पलमेकं सुवर्णस्य रसेन्द्रस्य पलाष्टकम् । रसस्य द्विगुणं गन्धं कज्जलीकृत्य यत्नतः ।
कुमारिकारसैर्भाव्यं काचपात्रे निधापयेत् । वालुयन्त्रे च संस्थाप्य क्रमशस्त्रिदिनं पचेत् ।।
साङ्गशीतं समादाय पुष्पारुणरजःसमम् । यवमात्रं प्रदातव्यमहिवल्लीदलैः सह ।।

रसस्य षड्गुणैर्गन्धैः पूर्ववत् कज्जलीकृते । भाविते पाचिते सम्यक् षड्गुणो बलिजारितः ।।
विधिवत् सेवितो ह्येष मुमुर्षुमपि जीवयेत् । एतदभ्यासतश्चैव जरामरणनाशनम् ।।
अनुपानविशेषेण करोति विविधान् गुणान् । ज्वरं त्रिदोषजं घोरं मन्दाग्नित्वमरोचकम् ।।
अन्यांश्च विविधान् रोगान्नाशयेन्नात्र संशयः । करोत्यग्निं बलं पुंसां वलीपलितनाशनः ।।
मेधायुःकान्तिजननः कामोद्दीपनकृन्महान् ।
भास्वज्ज्योतिर्यथा भाति काचे नीलादिके शुभे । तथानुपानभेदेन क्रियावान् मकरध्वजः ।।

(Bṛhat rasarāja sundara; Uttara-khaṇḍa)

Ingredients:

1. Śuddha swarṇapatra : 1 part
2. Śuddha pārada : 8 parts
3. Śuddha gandhaka : 16 parts

Method of preparation:

First of all swarṇapatra is carefully cut into smaller pieces and taken in a clean khalva yantra. To it equal quantity of śuddha pārada is added and triturated slowly with caution for 2 to 3 days until we get a uniform butter like amalgam with no shiny particles of gold left out. This may be tested by rubbing the amalgam in between the fingers.

Later it is added with remaining pārada and mentioned quantity of gandhaka to the same khalva yantra. It is triturated continuously for another 2 to 3 days until appropriate kajjalī is formed. And the prepared kajjalī is again subjected for one day's bhāvanā with ghṛtakumārī swarasa.

The product obtained is carefully collected and filled into mṛtvastralepita kācakūpī (beer bottle of 650 ml capacity), the mouth of the bottle is closed with a cork, placed firmly in vālukā yantra (with 2 inch sand below the bottle and its mouth 2 inches above the sand level) to subject it for mṛdu, madhyama and tīkṣṇa agni respectively for a day each.

The cork has to be removed soon after beginning the heating process. Once madhyamāgni of a day is applied, fumes start rising from the mouth of the bottle. In case the neck of the bottle gets blocked, it has to be cleared with a hot iron rod (tapta śalāka of 2 meters length) so that the sodium dioxide produced inside the bottle moves out, if not it breaks the bottle.

Fumes will be followed by flames emerging out and after another 2 hours flames and fumes gradually subside indicating the completion of the medicine formation inside the bottle.

At this point the base of the bottle appears deep red colored if cautiously watched. Now the cork of the bottle has to be re-fitted and correctly sealed with mud smeared cloth. The vālukā around the neck of the bottle is removed and allowed to cool on its own.

Next day the bottle is taken out from vālukā yantra and carefully wrecked by tying the kerosene soaked thread around the bottle at appropriate place and igniting, and later rolling the bottle in a wet cloth.

The makaradhvaja rasa at the neck and the molten gold solidified at the base are collected separately. The drug material from the base is incinerated again to mix with the makaradhvaja rasa obtained at the neck and preserved as end product in an airtight glass container. The medicine will be reddish in color with no odor and taste.

Dosage, adjuvant and therapeutic utility:

Half to 1 rattī (62.5 mgs to 125 mgs) of the medicine is administered along with madhu or tāmbūla patra swarasa. This medicine delays old age and death. With different adjuvants it cures sannipāta jwara, agnimāndya, aruci and other many diseases. This aggravates agni and bala, alleviates vali-palita, improvises medhā (intellect), āyu (life span), kānti (radiance) and kāma-śakti (sexual vigor).

Simile: As the light reflected from nīlādi ratna becomes brighter, in the similar way this formulation is therapeutically more efficacious with different adjuvants.

**2. Siddhamakaradhwaja rasa:**

पलमानं रसं सम्यग् वहुसंस्कारसंस्कृतम् । तथा पलद्वयं गन्धं शुद्धं हेम द्विकार्षिकम् ।।
कैलाशाचलसम्भूते सुदृढे च सुचिक्कणे । शोणप्रस्तरजे खल्ले सर्वं संस्थाप्य मिश्रयेत् ।।
मर्दयेद् यत्नतो वैद्यो यामानष्टौ निरन्तरम् । रक्तकार्पासपुष्पस्य श्वेताङ्कोठफलस्य च ।।
कुमार्याश्च रसैः सम्यग् भावयित्वा पृथक् पृथक् । स्थापयित्वा काचकूपीमध्ये सर्वं प्रत्यत्नतः ।।
रक्ताङ्गसालसरलखदिरश्रीफलोद्भवाम् । काष्टेनान्यतमेनैव नीरसेन प्रतापयेत् ।।
मृदुनाऽनलयोगेन प्राग् यामद्वितयं पचेत् । पुनर्यामद्वयं पाच्यं मध्यतापेन वन्हिना ।।
अग्निप्रखरेणैव ततो यामद्वयं पचेत् । भूयो मन्दाग्निना पाच्यमवशिष्टद्वियामकम् ।।
स्वाङ्गशीतमथोद्घृत्य नवचूतदलोपमम् । भङ्गुरं लोहितं पिष्टं दाडिमकुसुमोपमम् ।।
ततोऽवतार्य गन्धेन द्विगुणेन विमर्दयेत् । भावयेत्पूर्ववद् भूयः पाचयेच्च प्रयत्नतः ।।
एवं वारद्वयं कुर्यात् सम्यगौषधसिद्धये । सन्निपातज्वरं घोरं मन्दाग्नित्वमरोचकम् ।।
आमशूलं कटीशूलं हृच्छूलं पंक्तिशूलकम् । कासं श्वासं च यक्ष्माणं शूलं कुष्ठमशेषतः ।।
गलोत्थानन्त्रवृद्धिं च तथाऽतिसारमेव च । श्लीपदं कफवातोत्थं चिरजं कुलजं तथा ।।
नाडीव्रणं तथा घोरं गुदामयभगन्दरम् । वायुं वहुविधं हन्ति ध्वजभङ्गं विशेषतः ।।

सेवनादस्य नश्यन्ति सर्वे रोगा न संशयः । करोत्यग्निं बलं वीर्यं वलीपलितनाशनः ।।
विधिवत् सेवितो ह्येष मुमूर्षुमपि जीवयेत् । स्वेच्छाहारविहारोऽपि न कदाचिद् विपद्यते ।।
मेधाऽऽयुःकान्तिजननः कामोद्दीपनकृन्महान् । वृद्धोऽपि तरुणस्पर्द्धी स्त्रीषु चापि वृषायते ।।
सेवनादस्य सम्राज्ञो गच्छन्ति प्रमदाशतम् । त्रैलोक्ये शुभदं श्रीमदेतदेव महौषधम् ।।
मृत्युञ्जयो यथाऽभ्यासान्मृत्युञ्जयति देहिनाम् । तथाऽयं साधकेन्द्रस्य जरामरणनाशनः ।।
स्वयं त्रैलोक्यनाथेन त्रैलोक्यहितमिच्छता । समर्पितोऽयं सिद्धेभ्यः करुणार्द्रेण वै यतः ।।
अतोऽयं भुवने ख्यातः श्रीसिद्धमकरध्वजः । भास्वान् यथा तमो हन्ति केशरी करिणं यथा ।।
तूलसङ्घं यथा वन्हिस्तथा रोगानसौ हरेत् ।। (B. R. Rasāyanādhikāra 73/85-104)

Ingredients:

1. Aṣṭasaṁskārita pārada : 1 pala (48 gms)
2. Śuddha gandhaka : 2 pala (96 gms)
3. Śuddha svarṇapatra : 2 karśa (24 gms)

- Bhāvanā dravya:

1. Raktakārpāsa puṣpa swarasa : 1 bhāvanā
2. Śveta aṅkoṭha phalarasa : 1 bhāvanā
3. Ghṛtakumārī swarasa : 1 bhāvanā

Method of preparation:

Mentioned quantity of gold foils are carefully cut into smaller pieces and taken in a clean khalva yantra. To it equal quantity of śuddha pārada is added and carefully triturated for 4 to 5 days to get a fine butter like drug material. Later it is added with remaining pārada and mentioned quantity of gandhaka and triturated further until appropriate kajjalī is prepared.

This kajjalī is subjected for 1 bhāvanā each with above mentioned bhāvanā dravya. The product obtained is carefully collected and filled into glass bottle covered with 7 layers of cloth smeared with wet mud (mṛt-vastra-lepita kācakūpī). The mouth of the bottle is closed with a cork and placed firmly in vālukā yantra. It is now subjected for mṛdu, madhyama, tīkṣna and again mṛdu agni respectively for 6 hours each.

The cork has to be removed after beginning the heating process. Once madhyamāgni for 6 hours is applied, fumes arise from the mouth of the bottle. In case the neck of the bottle gets blocked, it is cleared by carefully inserting a hot iron rod (taptaśalāka) into the bottle neck. With intense heat (tīkṣnāgni) of 6 hours the flames emerge from the bottle; and after some time, the flames and fumes gradually subside. Mandāgni of another 6 hours is applied and it is allowed to cool down on its own.

At the stage when fumes and flames subside, if the base of the bottle is visualized with torch light by keeping the surrounding dark, it appears deep red colour indicating the new compound formation. Soon, the cork of the bottle has to be re-fitted and correctly sealed with mud smeared cloth. The vālukā around the neck of the bottle is removed and allowed to cool on its own. Next day the bottle is taken out from vālukā yantra, cloth and mud layer around the bottle is carefully removed and the medicine inside is located.

Later to break the bottle, a kerosene soaked thread is tied at correct place around the bottle. The thread is ignited and allowed to burn. When all the thread burns, the bottle is immediately rolled in a wet cloth. Sudden change in temperature breaks the bottle evenly at thread tied place. Later the siddha makaradhwaja rasa at the bottle-neck is collected in khalva yantra and triturated.

It is again added with double quantity of gandhaka and the mixture is subjected for 1 bhāvanās each with above quoted bhāvanā dravya. The mixture is filled into 'kāca-kūpī' and all the process of kūpī pāka is repeated. Like this the process is repeated for two more times. Each time double quantity of śuddha gandhaka is added and trituration with above quoted bhāvanā dravya. By repeating the process for 3 times, 6 parts of gandhaka jāraṇa is done into pārada. After 3rd process, the deep red colored tasteless and odourless 'siddha makaradhwaja rasa' is obtained.

Dosage, adjuvant and therapeutic utility:

One to 2 rattī (125 mgs to 250 mgs) of the medicine is administered daily along with suitable adjuvant or honey. This medicine is a potent rasāyana. It is indicated in sannipāta jwara, mandāgni, aruci, āma-śūla, kaṭi-śūla, hṛdaya-śūla, pakti-śūla, śwāsa, kāsa, rājayakṣma, all types of kuṣṭha roga, galaroga, āntra-vṛddhi, atisāra, ślīpada, nāḍī-vraṇa, bhagandara, guda-roga, vātaroga and especially in dhvaja-bhaṅga (erectile dysfunction).

*Hype:* This medicine improves the appetite, strength and virility. Vali-palita roga and other aging processes are reversed. Its proper use will bring back the patient from death-bed. During its administration the person may take food as per his wish. It promotes intellect, improves quality of life and provides good radiance and optimum virility. Even an old person becomes so virile that he competes with young men in having sex. Kings in olden days used to sexually satisfy thousands of his women with the use of this medicine. This medicine is best known rasāyana in all the 3 loka. As praying Lord Śiva makes the person in death-bed healthy, in the similar way consumption of this medicine is beneficial. The Lord himself has formulated this medicine for the benefit of humankind. As sun droves away the darkness and lion the elephants, in the similar way this medicine is cures the above quoted disease conditions.

Note: Few other references for Makaradhvaja rasa are found in B. R. Jvarādhikāra 5/1214-1221; B. R. Pramehapiḍakādhikāra 38/13-15; B. R. Rasāyanādhikāra 73/82-84; B. R. Vājīkaraṇādhikāra74/108-117; R. Yo. Sā. II part; 'ma'kāra rasa/preparation no 469, 470, 471 and 472 (prathama to caturtha);

**3. Malla sindūra rasa:**

> नवकर्षमितः सूतो रसचन्द्रश्च तत्समः । चतुःकर्षमितो मल्लः सार्धपञ्चाक्षसम्मितः ॥
> गन्धकश्चेति तत्सर्वं काचकूप्यां निधापयेत् । क्रमवृद्धाग्निना सम्यग्वालुकायन्त्रगं पचेत् ॥
> वन्हिं षोढशयामञ्च दत्त्वा शीतं समुद्धरेत् । रसोऽयं मल्लसिन्दूरः सर्ववातविकारनुत् ॥
> युक्तानुपानतो हन्यात्सन्निपातादिकान्गदान् ॥

(R. Yo. Sā. II part; 'ma'kārādi rasa/preparation no 538)

Ingredients:

| | | |
|---|---|---|
| 1. Śuddha pārada | : | 9 karṣa (138 gms) |
| 2. Rasakarpūra | : | 9 karṣa (138 gms) |
| 3. Śuddha gaurīpāśāṇa | : | 4 karṣa (48 gms) |
| 4. Śuddha gandhaka | : | 5.5 karṣa (66 gms) |

Method of preparation:

Rasakarpūra and śuddha malla are taken in a clean khalva yantra along with śuddha pārada and triturated properly to incorporate them into pārada. Later it is added with śuddha gandhaka and triturated further for 2 to 3 days to prepare appropriate kajjalī.

The product obtained is carefully collected and filled into mṛtvastralepita kācakūpī, the mouth of the bottle is closed with a cork, placed firmly in vālukā yantra to apply mṛdu, madhyama and tīkṣṇa agni respectively for 16 yāmas (48 hours).

The cork has to be removed after beginning the heating process. Once madhyamāgni for 4 to 6 yāma is applied, fumes start rising out from the mouth of the bottle. In case the neck of the bottle gets blocked, it has to be cleared with a hot iron rod (taptaśalāka). It will be followed by flames emerging out and after another 3 to 4 yāmas flames and fumes gradually subside indicating the completion of the medicine formation inside the bottle.

At this point the base of the bottle appears deep red colored if carefully watched. Now the cork of the bottle has to be re-fitted and correctly sealed with mud smeared cloth. The vālukā around the neck of the bottle is removed and allowed to cool on its own.

Next day the bottle is taken out from vālukā yantra and carefully wrecked as per procedure. The reddish coloured, odourless and tasteless 'malla sindūra' rasa obtained at the neck is carefully collected and preserved as end product in an airtight glass container.

Dosage, adjuvant and therapeutic utility:

One rattī (125 mgs) of this medicine is administered daily along with suitbale adjuvant. It is useful in all vātavikāra, sannipātika vikāra, śvāsa and kāsa.

Note: Few other references for 'Malla sindūra rasa' are found in R. Yo. Sā. II part; 'ma'kāra rasa/preparation no 539, 540 (dvitīya and tṛtīya).

### 4. Rasa karpūra:

पलसंमितं प्रयत्नाद् विमलीकृतं रसेशम् । सपलार्द्धकं पलैकं विमलं च गन्धकाम्लम् ।।
चषकोपमे विशुद्धं निदधीत काचपात्रे । विनिधाय काचपात्रं त्वयसस्त्रिपादिकायाम् ।।
ज्वलिते सुराप्रदीपे संशोषयेज्जलांशम् । अथ शोषिते तु चूर्णं त्ववतार्य वै प्रदीपात् ।।
समभागिकं च दद्याल्लवणं तु सैन्धवाख्यम् । परिमैल्य चूर्णमेतन्निदधीत काचकुप्याम् ।।
युगसङ्ख्यकैस्तु यामैः सिकताख्ययन्त्रसंस्थम् । विपचेदतिप्रयत्नात् रसतन्त्रकर्मविज्ञः ।।
अववुध्य काचकूपीं स्वत एव शीतलाङ्गीम् । घनसारनामधेयं रसमाहरेद्रसज्ञः ।।
जलीयबाष्पे निर्याते पिधानेन पिधापयेत् । कूपीकण्ठस्थितां स्वल्पां सिकताञ्चापसारयेत् ।।

(R. T. 6/65-71)

Ingredients:

1. Śuddha pārada : 1 pala (48 gms)
2. Gandhakāmla ($H_2So_4$) : 1.5 pala (72 gms)
3. Saindhava lavaṇa : 1 pala (48 gms)

Method of preparation:

Mentioned quantity of śuddha pārada and concentrated Sulphuric acid ($H_2So_4$) are cautiously taken in a beaker of suitable size. It is placed over a tripod stand and heated with a spirit lamp from beneath. The heating is continued until all the liquid part is lost and only powder remains.

The powder in the beaker is now collected and taken in a clean porcelain pestle and mortar. To it, equal quantity of saindhava lavaṇa (fine powder) is added and triturated to obtain homogenous mixture. This mixture is carefully filled into mṛtvastralepita kācakūpī (beer bottle systematically covered with 7 layers of mud smeared cloth). The mouth of the bottle is closed with a cork, placed firmly in vālukā yantra. The cork is removed soon after beginning the process of heating and mṛdu, madhyama and tīkṣna agni is applied respectively for 4 prahara (12 hours).

Once madhyamāgni of 3 to 4 hours is given, fumes start rising from the mouth of the bottle. In case the neck of the bottle gets blocked, it has to be cleared with a hot iron rod (taptaśalāka). It will be followed by flames emerging out and after another 2 to 4 hours flames and fumes gradually subside.

At this point the base of the bottle appears deep red colored if cautiously watched. Now the cork of the bottle has to be re-fitted and correctly sealed with mud smeared cloth. The vālukā (sand) around the neck of the bottle is removed and application of heat is continued with tīkṣna agni for the remaining time. After 12 hours of heat, the fire is put off and the vāluka yantra is allowed to cool on its own.

Next morning, the bottle is taken out from vālukā yantra. The mud smeared cloth is cut and removed. The medicine inside is spotted and carefully wrecked as per procedure explained in the classics. The rasa karpūra is found accumulated at the neck. It is collected and preserved in an airtight **glass container** only with proper label.

Note: The 'Rasa karpūra' prepared with this method will be a good medicine. It causes no burning sensation as it is the case with 'Rasa puṣpa' during internal administration.

**Rasa karpūra- general dose:**

आरभ्य रक्तिकायास्तु चतुःषष्ट्यंशतो भिषक् । द्वात्रिंशद्भागपर्यन्तं मात्रामस्य प्रयोजयेत् ।।

(R. T. 6/76)

The dosage of 'rasa karpūra' is 1/64 rattī to 1/32 rattī (1.9 mgs to 3.9 mgs). The dosage has to be decided by the physician considering all the factors that influence the dosage.

**Rasa karpūra- indications:**

रसकर्पूरकं ख्यातो बहुभूतविषापहः । त्वग्रक्तदोषशमनो ग्राही रुचिविवर्द्धनः ।।
अतीसारप्रशमनो विशेषात्कृमिनाशनः । प्रवाहिकाहरः कामं मात्राधिक्ये विषक्रियः ।।

dr.keshav_raj

स्फोटं कण्डूमपि च चिरजां मण्डलादींश्च कुष्ठान् । सर्वोत्थं वा सहजमपि वा स्पर्शजं वा फिरङ्गम् ।
शीघ्रं नानाव्रणगणभवां हन्ति पीडां महोग्रां कर्पूराख्यो जठरदहनोद्दीपनोऽयं रसेशः ॥
शीतले षोडशगुणे सलिले विनिपातितः । सर्वथा द्रवतां याति रसः कर्पूरकाभिधः ॥

(R. T. 6/72-75)

Rasa karpūra is effective in kṛmi viṣa (infections, animal and insect bites). It cures twak and rakta doṣa. It exhibits grāhī property by restricting the excessive secretions in wounds. It cures atisāra, kṛmi roga and kapha-raktaja pravāhika. If this medicine is administered in excessive dosage, the chances of its toxic influence cannot be ruled out.

This medicine is also indicated in sphoṭa; kaṇḍū (chronic itching); maṇḍala and other types of kuṣṭha roga; sannipātika, sahaja and other types of phiraṅga roga; and all types of pains in different types of wounds. When administered in suitable dosage, besides curing all the above said diseases, it improves the appetite of the person. If this medicine is added with 16 parts of cold water, it completely dissolves in it.

**5. Rasapuṣpa:**

शुद्धं तोलकपञ्चकं रसवरं काशीसकं सैन्धवं दत्वा चैव समं समं सुमसृणे खल्वे ततः पेषयेत् ।
कूपीमध्यगतं पचेत्तु सिकतायन्त्रेऽथ यामद्वयम् नीहारप्रभमूर्ध्वभागनिचितं पुष्पं रसाद्यं हरेत् ॥
जलीयवाष्पे निष्क्रान्ते पिधानेन पिधाय वै । कूपिकाकण्ठदेशस्थां बालुकामपसारयेत् ॥
पुष्पवच्छोभते यस्मात्कूपीकण्ठप्रलम्बितम् । रसपुष्पमिदं तस्मात्प्राणाचार्यैर्निगद्यते ॥

(R. T. 6/29-31)

Five tola (60 gms) each of 1. Śuddha pārada 2. Saindhava lavaṇa and 3. Śuddha kāsīsa; are taken in a clean khalva yantra and triturated thoroughly to obtain a homogenous drug mixture.

The obtained drug mixture is carefully collected and filled into 'mṛtkapaṭita kācakūpī' (beer bottle systematically covered with 7 layers of mud smeared cloth). The mouth of the bottle is closed with a cork, placed firmly in vālukā yantra to apply mṛdu, madhyama and tīkṣna agni respectively for around six hours.

The cork has to be removed after beginning the heating process. Once madhyamāgni for 2 to 3 hours is applied, fumes start rising from the mouth of the bottle. When all the fumes disappear, the cork of the bottle has to be refitted and correctly sealed with mud smeared cloth. The sand around the neck of the bottle is removed up to 2 inches, so that the formed compound accumulates in that place. After six hours of heat, the bottle is left to cool overnight on its own.

Next day the bottle is taken out from vālukā yantra, medicine is precisely spotted and carefully wrecked as per the procedure. The medicine is obtained adhered at the neck of the bottle like a flower, so it is called '**rasapuṣpa**'. It is later preserved carefully in airtight glass container.

### Rasapuṣpa- confirmatory test:

महोज्ज्वले लोहपात्रे जलविन्दुं तु विन्यसेत् । रसपुष्पं समादाय जलविन्दौ विनिक्षिपेत् ।।
क्षणादूर्ध्वं जलं क्षिप्त्वा यदि कार्ण्यं न लभ्यते । रसपुष्पं तदा शुद्धं जानीयाद्द्विपजां वरः ।।
(R. T. 6/39-40)

To confirm the purity of 'rasapuṣpa', place a pinch of the medicine over an 'iron plate' and add a drop of water over it. After some time displace the drop of water and examine the surface for any blot. If any black coloured blot is found, then the medicine is considered incomplete and impure. If no blot is seen, then the rasa puṣpa is free from any saline part (saindhava lavaṇa). This indicates that the product is proper and complete.

### Rasapuṣpa- properties:

रसपुष्पं पित्तहरं मूत्रलं व्रणदोषहृत् । परं विरेचनकरं तथा भूतविषापहम् ।।
स्वस्थीकरणमत्यन्तं जलीयांशविशोषणम् । पित्ताशयं तु विक्षोभ्य मलपित्तापसारकम् ।।
कृमीन् विषूचिकोद्भूतान् हिक्काञ्चैव फिरङ्गकम् । जलोदरादिकान् रोगान् नाशयत्यविलम्बितम् ।।
(R. T. 6/41-43)

Rasapuṣpa administered internally in appropriate dosage will cause 'purgation to dislodge vitiated pitta' (pitta-virecaka) and excessive urination (diuretic). It cures infectious wounds and is a strong virecaka of pitta doṣa. It prevents or cures all kinds of contagious infections (bhūta-viṣa). Since it is a diuretic, it dries up the excessive water in the body. It dislodges vitiated pitta doṣa from 'pittāśaya' (gall bladder). It is effective in curing visūcikā (diarrhoea), kṛmi (worm infections), hikkā (hick-up), phiraṅga roga (syphilis) and jalodara (ascites).

### Rasapuṣpa- mātrā:

गुञ्जार्द्धतः समारभ्य सार्द्धगुञ्जद्वयोन्मिता ।।
रसपुष्पस्य मात्रा हि सार्द्धगुञ्जद्वयोन्मिता । गुञ्जाष्टमांशप्रमिता मात्रा हिक्कामये हिता ।।
फिरङ्गरोगाय मता गुञ्जा पादांशसंमिता । इयमेव मता मात्रा शिशूनां तु विरेचने ।। (R. T. 6/44-46)

Rasapuṣpa is administered internally in the dosage of half rattī to 2.5 rattī (62.5 to 312.5 mgs). For inducing purgation, it has to be given in full 2.5 rattī

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dosage. To cure hikkā, it is given in the dosage of one rice grain (roughly quarter rattī; 31 mgs). To cure syphilis, quarter rattī of the medicine is administered for required number of days. And to induce purgation in children, it is given in the dosage of half rattī (62.5 mgs).

Dosage, adjuvant and therapeutic utility:

> रसपुष्पं सार्द्धगुञ्जद्वितीयं स्वर्जिकान्वितम् । शीलितं रेचयत्येव कामं यामद्वयोत्तरम् ।।
> शीलितं रसपुष्पन्तु वारिणा गुञ्जापादिकम् । विसूच्यास्तु समारम्भे विसूचीकृमिसंघनुत् ।।
> रसागमपरिज्ञानविहीनो भिषगल्पधी: । निरन्तरं विशेषेण रसपुष्पं न योजयेत् ।। (R. T. 6/47-49)

Rasapuṣpa in the dosage of 2.5 rattī (312.5 mgs) if added with 5 or 6 rattī (625 to 750 mgs) 'sarjakṣāra' (Sodium bicarbonate; $NaHCO_3$) and administered along with water or milk, will induce virecana after 6 hours. At the beginning of visūcikā (diarrhoea), if quarter rattī (31 mgs) of 'rasapuṣpa' is administered along with water, it prevents the infection and thus brings down the disease severity.

Rasapuṣpa should not administered blindly by anyone without its proper knowledge. Experts in the field of 'Rasaśāstra' should meticulously think about its dosage and all the relevant factors, only than the medicine may be administered.

### 6. Rasasindūra:

> पलमात्रं रसं शुद्धं तावन्मात्रन्तु गन्धकम् । विधिवत्कज्जलीं कृत्वा न्यग्रोधाऽङ्कुरवारिभिः ।।
> भावनात्रितयं दत्त्वा स्थालीमध्ये निधापयेत् । विरच्य कवचीयन्त्रं वालुकाभिः प्रपूरयेत् ।।
> दद्यात्तदनु मन्दाग्निं भिषग्यामचतुष्टयम् । जायते रससिन्दूर तरुणादित्यसन्निभम् ।।
> अनुपानविशेषेण करोति विविधान्गुणान् ।।
>
> (R. Yo. Sā. II part; 'ra'kārādi rasa/preparation no 110)

Ingredients:

1. Śuddha pārada : 1 pala (48 gms)
2. Śuddha gandhaka : 1 pala (48 gms)
- Bhāvanā dravya : Vaṭāṅkura swarasa

Method of preparation:

Śuddha pārada and śuddha gandhaka are taken in a clean khalva yantra and triturated properly to obtain appropriate kajjalī. This kajjalī is subjected or 7 bhāvanās with 'vaṭāṅkura swarasa'.

The bhāvita kajjalī obtained is carefully collected and filled into 'mṛtvastralepita kācakūpī', the mouth of the bottle is closed with a cork, placed firmly in vālukā yantra to apply mṛdu, madhyama and tīkṣna agni respectively for 4 yāma (12 hours).

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The cork has to be removed after beginning the heating process. Once madhyamāgni for 4 to 6 hours is applied, fumes start rising out from the mouth of the bottle. In case the neck of the bottle gets blocked, it has to be cleared with a hot iron rod (taptaśalāka). It will be followed by flames emerging out and after another 2 to 3 hours flames and fumes gradually subside indicating the completion of the medicine formation inside the bottle.

At this point the base of the bottle appears deep red colored. Now the cork of the bottle has to be re-fitted and correctly sealed with mud smeared cloth. The vālukā around the neck of the bottle is removed and allowed to cool on its own.

Next day the bottle is taken out from vālukā yantra and carefully wrecked as per the procedure. The rasasindūra obtained at the neck is carefully collected and preserved as 'rasasindūra' in an airtight glass container. The product will be odourless and tasteless with 'māṇikya varṇa'.

Dosage, adjuvant and therapeutic utility:

One to two rattī (125 mgs to 250 mgs) of 'rasasindūra' is administered along with honey, ghee, butter or any other suitbale adjuvant. It is useful as rasāyana, vājīkara, balavardhaka etc; it is indicated in jwara, prameha, śūla, bhagandara, kṣaya, gulma, pāṇḍu, sthaulya, vraṇa, agnimāndya and kuṣṭha.

Note: Few other references for 'Rasasindūra' are found in R. Yo. Sā. II part; 'ra'kāra rasa/preparation no 111, 112, 113, 114, 115, 116, 117, 118 and 119 (dvitīya to daśama respectively); the one explained above is largely prepared.

**7. Samīrapannaga rasa:**

पारदं गन्धकं मल्लं हरितालं तथैव च । एतच्चतुष्टयं सर्वं तुलसीरसमर्दितम् ।।
वटीं कृत्वाऽभ्रकेणैव वेष्टयेद्गोलकन्तु तत् । शरावयुगले क्षिप्त्वा वालुकायन्त्रगं पचेत् ।।
दीपिकाप्रमितं वह्निं दत्त्वा यामचतुष्टयम् । स्वाङ्गशीतं समुद्धृत्य नाम्नाऽसौ वातपन्नगः ।।
सन्निपाते तथोन्मान्दे सन्धिबन्धे कफामये । नागवल्ल्या दलेनैव भक्षयेद्गुञ्जिकाद्वयम् ।।

(R. Yo. Sā. II part; 'sa'kārādi rasa/preparation no 303)

Ingredients:

1. Śuddha pārada : 1 part
2. Śuddha gandhaka : 1 part
3. Śuddha gaurīpāśāṇa : 1 part
4. Śuddha haratāla : 1 part

- Bhāvanā dravya : Tulasī swarasa

Method of preparation:

Śuddha pārada is taken in a clean khalva yantra and is added with śuddha malla and śuddha haratāla. The mixture is triturated for a while and later śuddha gandhaka is added and trituration is continued for another two days until appropriate kajjalī is formed.

This kajjalī is triturated with tulasī swarasa for a day and a bolus of the drug mass is prepared. This bolus is covered with abhraka patra and placed in śarāva of appropriate size. This śarāva is closed with another śarāva of same size to make a śarāva sampuṭa. After proper sandhi-bandhana of the sampuṭa it is dried and placed in the middle of vālukā yantra with half the sand below and half above.

Four prahara (16 hours) mandāgni is applied to the vālukā yantra. When it cools down on its own, the śarāva sampuṭa is taken out, sandhi-bandhana is removed and the inner drug material is triturated in khalva yantra and stored in airtight glass container for further therapeutic use.

### Another method of preparation:

The kajjalī is subjected for 7 bhāvanās with tulasī swarasa and the obtained end product is carefully collected and filled into mṛtvastralepita kācakūpī, the mouth of the bottle is closed with a cork, placed firmly in vālukā yantra to apply mṛdu, madhyama and tīkṣna agni respectively for 4 prahara (12 hours).

The cork has to be removed after beginning the heating process. Once madhyamāgni for 4 to 6 hours is applied, fumes start rising out from the mouth of the bottle. In case the neck of the bottle gets blocked, it has to be cleared with a hot iron rod (taptaśalāka). It will be followed by flames emerging out and after another 2 to 3 hours flames and fumes gradually subside indicating the completion of the medicine formation inside the bottle.

At this point the base of the bottle appears deep red colored. Now the cork of the bottle has to be re-fitted and correctly sealed with mud smeared cloth. The vālukā around the neck of the bottle is removed and allowed to cool on its own.

Next day the bottle is taken out from vālukā yantra and carefully wrecked as per procedure. The samīrapannaga rasa obtained at the neck is carefully collected and preserved as end product in an airtight glass container. The product will be odourless and tasteless with reddish colour.

### Dosage, adjuvant and therapeutic utility:

One to two rattī (125 mgs to 250 mgs) of 'rasasindūra' is administered along with nāgavallīpatra swarasa or any other suitbale adjuvant. It is useful in sannipātaja vikāras, unmāda, sandhibandha sannipāta and kaphaja roga.

Note: Other reference for Samīrapannaga rasa is found in R. Yo. Sā. II part; 'sa'kāra rasa/preparation no 302; the one explained above is largely accepted.

### 8. Swarṇavaṅga:

प्रक्षिपेद् भाजने वङ्गमायसे चापि मृन्मये । विद्रुते वह्नितापेन तस्मिंस्तन्मानकं रसम् ॥
क्षिप्त्वा सञ्चूर्णयेत्तत्र नरसारं च गन्धकम् । तनुवासोमृदालिप्तकाचकूप्यां विधाय च ॥
तत्सर्वं सिकतायन्त्रे पचेद् यामचतुष्टयम् । पाकात्सञ्जायते चित्रं कीर्णं हेमकणैरिव ॥
रमणीयतरं स्वर्णवङ्गं नाम रसायनम् । वल्यं मेहहरं कान्तिमेधावीर्याग्निवर्द्धनम् ॥

(B. R. Prameharogādhikāra 37/164-167)

Ingredients:

1. Śuddha vaṅga : 1 part
2. Śuddha pārada : 1 part
3. Śuddha gandhaka : 1 part
4. Śuddha navasādara : 1 part

Method of preparation:

Mentioned quantity of śuddha vaṅga is taken in a clean loha darvī and heated to liquefy it. Molten vaṅga is soon poured into the khalva yantra which contains mentioned quantity of pārada. Soon the mixture is triturated rigorously for about 30 minutes to obtain the drug mixture in powder form.

This powder is added with quarter part of saindhava lavaṇa and triturated. Later the mixture is repeatedly washed with water to remove all the salt in the mixture. Later the drug powder is dried under hot sun. This dry powder is taken back in khalva yantra and added with mentioned quantity of śuddha gandhaka. The mixture is triturated again for 2 to 3 days to obtain appropriate kajjalī. Later it is added with navasādara and triturated to obtain a homogenous mixture.

This drug mixture is carefully filled into 'mṛt-vastralepita kācakūpī' (bottle prepared with 7 layers of mud and cloth for kūpī-pāka) and the mouth of the bottle is closed with a cork. The bottle is firmly placed in vālukā yantra to apply mṛdu, madhyama and tīkṣṇa agni respectively for 4 yāma (12 hrs).

The cork is removed after beginning the heating process. Once medium heat for 3 to 4 hours is applied, fumes start rising from the mouth of the bottle. In case the neck of the bottle gets blocked, it has to be cleared with a hot iron rod (taptaśalāka).

It will be followed by flames emerging out. After another 2 to 4 hours, the flames and fumes gradually subside indicating the completion of the medicine formation inside the bottle.

At this point the base of the bottle appears golden red colored if carefully watched and yellowish drug material sticks to the cold rod carefully dipped into the bottle. Now the cork of the bottle has to be re-fitted and correctly sealed with mud smeared cloth. The vālukā around the neck of the bottle is removed and allowed to cool on its own.

Next day the bottle is taken out from vālukā yantra and carefully wrecked as per procedure. The swarṇavaṅga rasa obtained from the base of the bottle is collected and preserved as end product in an airtight glass container. The medicine will be of golden colour with no odour and taste.

Dosage, adjuvant and therapeutic utility:

One to 2 rattī (125 mgs to 250 mgs) of the medicine is administered along with honey, ghee or milk. It is known balakāraka (strengthening), rasāyana (rejuvenator), vṛṣya (aphrodisiac), buddhi-vardhaka (intellect promoter) and is indicated in all types of prameha roga.

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## Chapter 26

# DRUGS & COSMETICS ACT (DCA) AND GOOD MANUFACTURING PRACTICES (GMP)

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## (I) THE DRUGS AND COSMETICS ACT (DCA)

**Introduction:**

Drug is an essential commodity and it requires to be regulated in terms of import, manufacture, sale and distribution. The central and the state governments are charged with the responsibility of providing the drug of desired quality to the needy patients and in order to ensure this primary obligation of the government, the network is required to be developed to root out adulteration, misbranded and spurious drugs from the society.

**History of DCA:**

The origin of DCA has a remarkable historical background. The enactment of the Act was an outcome of a sustained struggle by the medical and the pharmaceutical fraternity of the country in pre independence era against the British misrule in providing poor health care system to Indian citizens.

The observation made by Drugs Equity Committee (DEC), representations made by Indian Medical Association (IMA), reports appeared in Indian Medical Gazette during 1920-30 and adverse press reports compelled the British rule to initiate remedial measures for overcoming lacuna existing in the health care system. The import of drugs bill introduced in 1937 was withdrawn due to heavy criticism and later on the Drug Bill was introduced and the Drugs and Cosmetic Act, 1940 was enacted. The rules of the same were framed under this Act in 1945.

The Act is passed by the parliament at different years with desired changes. This Act is divided into five chapters. The chapters include all the specifications of the Act with all finer details & terms & provisions. The copy of the Act may be obtained from any handbook released from government or else it may be easily checked and downloaded in web. The chapters are as given below.

I. CHAPTER I: INTRODUCTORY

II. CHAPTER II: THE DRUGS TECHNICAL ADVISORY BOARD, THE CENTRAL DRUGS LABORATORY AND THE DRUGS CONSULTATIVE COMMITTEE

| | |
|---|---|
| | COMMITTEE |
| III. CHAPTER III: | IMPORT OF DRUGS AND COSMETICS |
| IV. CHAPTER IV: | MANUFACTURE, SALE AND DISTRIBUTION OF DRUGS AND COSMETICS SECTIONS |
| V. CHAPTER IVA: | PROVISIONS RELATING TO ĀYURVEDIC SIDDHA AND UNANI DRUGS |
| VI. CHAPTER V: | MISCELLANEOUS |

There are 2 Schedules to the Act and 35 Schedules to the rules framed under the act. It was in the year 1982, Schedules E, I, L were dropped, Schedules G and H were revised and Schedule X was introduced. In 1988 Schedule M incorporating GMP (Good Manufacturing Practices) was amended and Schedule Y pertaining to clinical trials of newer drug formulations was incorporated. Schedule T of Āyurveda, Siddha and Unani medicines was introduced in 2000.

## THE SCHEDULES TO THE RULES

| | |
|---|---|
| Schedule A | Different forms of application to procure license, renewal of license and for all other activities. |
| Schedule B | Rates of fee charged for analysis by state drug laboratories. |
| Schedule C | List of biological and other special products governed by special provisions. |
| Schedule C (I) | List of other special products governed by special provisions. |
| Schedule D | Class of drugs—extent and conditions of exemption. |
| Schedule D (I) | Undertaking of the manufacturer or his authorized agent required to be submitted along with application form for obtaining a registration certificate. |
| Schedule D (II) | Undertaking of the manufacturer of his authorized agent required to be submitted along with application form for registration of a bulk drug or its formulation or its import into India. |
| Schedule E (I) | List of poisonous substance under Āyurveda, Siddha and Unani medicines. |
| Schedule F | Requirement for operation of blood bank and/or preparation of blood components. |
| Schedule F (I) | Provisions for bacterial vaccines, viral vaccines, antisera, diagnostic antigens etc. |
| Schedule F (II) | Standards for surgical dressings. |
| Schedule F (III) | Standards for umbilical tapes. |
| Schedule FF | Standards for ophthalmic preparations. |
| Schedule G | Drugs required to be taken under medical supervision. |
| Schedule H | List of prescription drugs. |
| Schedule J | List of diseases or ailments which a drug may not purport to prevent |

| | |
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| | or cure. |
| Schedule K | Drugs exempted from certain provisions related to manufacturer. |
| Schedule M | GMP (Good Manufacturing Practices) comprising requirements of factory premises, plant and equipment. |
| Schedule M (I) | Homeopathic preparations requirements of factory premises, plants and equipment. |
| Schedule M (II) | Cosmetics—requirements of factory premises for manufacture. |
| Schedule M (III) | Requirements of factory premises for manufacture of medical devises. |
| Schedule N | List of minimum equipment of running a pharmacy. |
| Schedule O | Standards for disinfectant fluids. |
| Schedule P | Life period of drugs. |
| Schedule P (I) | Pack sizes of drugs. |
| Schedule Q | List of colors, dyes and pigments permitted in cosmetics and soaps, list of colors permitted in soaps. |
| Schedule R | Standards for condoms of rubber latex and other mechanical contraceptives. |
| Schedule R (I) | Standards for medical devises. |
| Schedule S | Standards for cosmetics. |
| Schedule T | GMP for manufacture of Āyurveda, Siddha and Unani medicines, GMP, machinery, equipment, minimum manufacturing premises etc. |
| Schedule U | Particulars required to be shown in manufacturing records: raw materials and analytical records. |
| Schedule U (I) | Particulars required to be shown in manufacturing records. |
| Schedule V | Standards for patent or proprietary medicines. |
| Schedule X | Psychotropic substances. |
| Schedule Y | Requirements and guidelines on clinical trials for import and manufacture of new drug. |

## IMPORTANT DEFINITIONS

### 1. Patent or proprietary medicine:

It means:

- A patent or proprietary in an official right to be the only pharmaceutical company allowed to manufacture or sell a new medicinal product for a certain period of time. Such patented medicines are proprietary medicines.
- In relation to Āyurveda, Siddha or Unani systems of medicine, all formulations containing only such ingredients mentioned in the formulae described by the authoritative books of that particular system are specified in first Schedule to the Act, but does not include the medicine administered by parenteral route are the patent medicines.

- In relation to any other systems of medicine including, allopathic, a drug presented in a form ready for internal or external administration of human beings or animals and which is not included for the time being in the edition of Indian or any other Pharmacopoeia are the patent medicines.

**2. Misbranded drugs:**

A drug may be referred as misbranded if:

- The drug so colored, coated, powdered or polished in such a way that the damage is concealed.
- The drug is made to appear of better or greater therapeutic value than it really is.
- The drug is not labelled in the prescribed manner.
- If its label or container or anything accompanying the drug bears any statement, design or device which makes any false claim for the drug or which gives false or misleading information.

**3. Adulterated drugs:**

A drug may be deemed to be adulterated if:

- If it consists, in whole or in part, of any filthy, putrid or decomposed substance.
- If it has been prepared, packed or stored under unsanitary conditions whereby it may have been contaminated with filth or whereby it may have been rendered injurious to health.
- If its container is composed in whole or in part, of any poisonous or deleterious substance that may render the contents injurious to health.
- If it bears or contains, for purposes of coloring only, a color other than one that is prescribed.
- If it contains any harmful or toxic substance which may render it injurious to health.
- If any substance has been mixed therewith so as to reduce its quality or strength.

**4. Spurious drugs:**

A drug may be deemed to be spurious if:

- If it is imported under a name which belongs to another drug.
- If it is an imitation of, or a substitute for, another drug or resembles another drug in a manner likely to deceive or bears upon it or upon its label or container the name of another drug unless it is plainly and conspicuously

marked so as to reveal its true character and its lack of identity with such other drug.

- If the label or the container bears the name of an individual or company purporting to be the manufacturer of the drug, which individual or company is fictitious does not exist; or if it has been substituted wholly or in part by another drug or substance.
- If it purports to be the product of a manufacturer of whom it is not truly a product.

**5. Misbranded cosmetics:**

A drug may be deemed to be misbranded if:

- If it contains a color which is not prescribed.
- If it is not labeled in a prescribed manner.
- If the label or container or anything accompanying the cosmetic bears any statement which is false or misleading in any particular.

**6. Spurious cosmetics:**

A drug may be deemed to be spurious if:

- If it is imported under the name which belongs to another cosmetic.
- If it is an imitation or a substitute for another cosmetic.
- If resembles another cosmetic in a manner likely to deceive.
- If it bears upon it or upon its label or container the name of another cosmetic, unless it is plainly or conspicuously marked so as to reveal its true character and its lack of identity with such other cosmetic.
- If the label or the container bears the name of an individual or company purporting to be the manufacturer of the cosmetic, which individual or company is fictitious or does not exist.
- If it purports to be the product of a manufacturer of whom it is not truly a product.

## (II) GOOD MANUFACTURING PRACTICES (GMP)

GMP is an essential and significant step taken by the government in improving the quality & standard of ASU (Āyurveda, Siddha & Unani) drugs being manufactured in about 9000 licensed ASU pharmacies in our country.

The gist of the enormous rules & regulations of GMP is provided here which is a part of UG and PG studies.

Gazette notification of India dated 23rd June 2000 vides GSR 560 E are as follows:

1. Rules for good manufacturing practices of ASU drugs indicating the essential infrastructure, manpower & other requirements have come into force from 23rd June 2000. However a buffer period of 2 years has been given to the existing registered manufacturing units to comply with these rules by improving the infrastructure. The qualifying units get the GMP certificate with immediate effect.
2. Registered vaidya, hakims & siddhas & also the teaching institutions preparing medicines for their own dispensing to patients have been exempted from the preview of GMP.
3. GMP are prescribed to ensure that:
   I. Raw materials used in the manufacture of the drugs are authentic, of prescribed quality & are free from contamination.
   II. The manufacturing process has been prescribed to maintain the standards.
   III. Adequate quality control measures are adopted.
   IV. The manufactured drug which is released for sale is of acceptable quality.
   V. To achieve the objects listed above, each licensee shall evolve methodology & procedures for following the prescribed process of manufacture of drugs, which should be documented as a manual & kept for reference & inspection.
4. Factory premises will have minimum covered area of 1200 sq ft + 200 sq ft for furnace & bhaṭṭī purposes. The manufacturing plant should have adequate space for:
   I. Receiving & storing raw materials
   II. Manufacturing process area
   III. Quality control section
   IV. Finished goods store
   V. Office
   VI. Rejected goods/drugs store

   Specification have also been laid down on location, surroundings of the building, water supply, sewage disposal, waste container, cleaning, storage of raw materials, packaging materials, finished goods store, working space, health & environment, sanitation of the workers including their medical services.
5. Specifications have been made about the batch of manufacturing, reference during the process of preparation etc.

6. Specific record of the market complaints will also have to be maintained.
7. Provisions for quality control have also been made through a separate quality control section. However the manufacturers will also use the quality control facilities of government approved laboratories.
8. One qualified person with degree in Āyurveda, Siddha & Unani will be posted in the quality control section. This is the mandatory requirement. In addition, they may have experts in pharmacy, pharmacognosy & chemistry.
9. The quality control will be as per the prescribed pharmacopoeial standards of ASU drugs. However where tests are not available, the test is enforced according to the manufacturers specifications or other information available may be given.
10. Specifications of area for other manufacturing activities like, pill making, capsuling etc have been specified. The GMP has also recommended the various equipment required for carrying out various manufacturing procedures.

The standards & specifications in the GMP have been kept moderate, keeping in view the interest of small scale industries in this sector. However the consumer's interest has been taken care of.

The implementation of GMP will increase the faith in public in the quality of ASU drugs. This will also meet the requirements of various importing countries for ASU drugs.

This step of government will therefore increase the domestic as well as export business of ASU drugs.

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## Chapter 27

# PHARMACOVIGILANCE

**Pharmacovigilance- etymology:**

- The term 'pharmaco' is derived from the Greek word *pharmacon* which means—the medicine, auṣadha or bheṣaja;
- The term 'vigilance' has its root in the Latin term *vigilantia* which means—alertness, wakefulness, watchfulness or attentiveness.
- So absolute alertness towards the medicine we administer to the patients—is the purview of pharmacovigilance.

**Pharmacovigilance- definition:**

Pharmacovigilance is the science which encompasses the activities concerning to the detection, assessment, understanding and prevention of Adverse Drug Reactions (ADRs) or any other possible drug related problems; particularly long term and short term side effects of medicines. It is the science dedicated to reduce the risk of the drug related harms to the consumers.

OR

Pharmacovigilance is the science of collecting, monitoring, researching, assessing and evaluating information from healthcare providers and patients on the adverse effects of medications, biological products, herbalism and traditional medicines with a view to identifying new information about hazards associated with medicines in order to preventing harm to patients.

**Introduction:**

Pharmacovigilance is relatively a newer branch of science, which is presently grabbing attention in Āyurveda fraternity. Though the classics of Āyurveda promptly describe all the adverse effects to irrationally procured, prepared and administered drugs or formulations, the physicians as well as the patients of Āyurvedic medicine usually have believed in the fact that the Āyurvedic medicine does not cause any adverse effects. Even now, this popular misconception about Āyurvedic medicine prevails among majority of the prescribers and consumers.

However, after noticing and validating many adverse drug effects with few of the herbal and majority of rasauṣadhies in the field of Āyurveda, it has become a pressing necessity to think on the safety of our products. Therefore, the branch of pharmacovigilance needs to be discussed, debated, learnt and taught in our field to our people.

भिषक् द्रव्याव्युपस्थाता रोगी पादचतुष्टयम् । चिकित्सितस्य निर्दिष्टं, प्रत्येकं तच्चतुर्गुणम् ।।
(A. H. Sū. 1/27)

The bhiṣak (physician), dravya (medicine), upasthā (attendant), and the rogī (patient) are the four pillars of treatment. We attribute four good qualities to each of these and expect them to be quite ideal. Our concern always will be to have these four limbs of treatment in harmony with each other so that we obtain the best possible treatment outcome.

Among these four limbs, what if one limb harms the other?! What if one is ailing because of the other?! What if one doesn't assure the safety of the other?!

This disharmony of any sort among these four limbs always leaves the 4th limb i.e. the patient at the receiving end. And in majority of the times the fault lies with the 2nd limb i.e. dravya (the medicine). Therefore, the safety of consumer health in relation with the use of safer and effective drugs has become the leading concern. There is global movement for the improvement of the patient safety. As this gains momentum, the drug safety becomes even more prominent issue.

Classics of Āyurveda mention abheṣaja-siddha as well as bheṣaja-siddha disease conditions, their diagnosis and treatment. They restrict use of any medication in abheṣajasiddha disease treatments, they are very cautious about the type of auśadha to be procured, processed and administered.

They are very specific about the dosage in which the medicine has to be administered. They do not forget to mention about ill effects in case if any medication is irrationally procured, processed, stored and used.

The technical term pharmacovigilance might not have featured in classical texts of Āyurveda but its essence is quite evident and is emphasized by almost all the classical texts. Dravyaguṇa Vijñāna (Āyurveda Pharmacology), Bhaiṣajya Kalpanā Vijñāna (Āyurveda Pharmaceutics) and Cikitsā (therapeutics) do methodically speak on this issue. The primary aim of this evident pharmacovigilance in Āyurvedic books is;

- The patient care and safety in relation with the drug.
- Promotion of rational drug use.

### Adverse drug reactions (ADRs) and Āyurveda:

The physicians as well as the consumers of Āyurvedic medicine firmly believed in the fact that our medicine does not cause any adverse reactions. On the other hand the classical texts of Āyurveda promptly describe all the adverse reactions to irrationally procured, prepared and administered drugs or formulations.

Our books are so keen on all the aspects relating to a drug or a formulation so that an effective and safe medicine is obtained. They consider the drug related factors such as; prakṛti, guṇa, karma, prabhāva, deśa, ṛtu, grahitam, nihitam and upaskṛtam. Similarly host related factors to be considered while selecting medicine to a particular patient are also described by Maharṣi Caraka as; prakṛti, vikṛti, vaya, bala, sātmya, āhāra śakti, vyāyāma śakti, sāra, sattwa and saṁhanana.

It is not only the herbal drugs and formulations Āyurveda prescribes; it has herbo-mineral and mineral/metallic drug formulations which attract more attention in terms of drug safety. Though appropriately prepared and administered rasauṣadhies are claimed to be safe, queries over their long-term safety looms large.

### Need for pharmacovigilance in Āyurveda:

Since early 19th century, Āyurveda has been a recognized formal medical system in India. Since then the institutionalized training has been initiated and upheld in India. Now India has many PG and UG teaching centres and approximately 5,00,000 practitioners have registered under state regulators of Indian medicine.

The picture of olden days practice is largely different from the present day's practice. In olden day's vaidya of Āyurveda used to instantly prepare the medicine required in smaller quantities, for a particular patient or two. However, that does not remain a mainline practice now. Ever increasing urbanization and more dependency on readymade preparations has amplified the demand of Āyurveda products in many folds. As a result the physician of Āyurveda has no option left out other than using the readymade-marketed preparations from different pharmaceutical companies. There are innumerable numbers of minor and mightier companies who have stepped into the preparation of Āyurvedic products.

Drugs and Cosmetic Act, 1940 regulates the manufacture and marketing of

Āyurvedic drugs. The drugs branded as Āyurvedic or Āyurvedic proprietary medicine may be categorized into two groups;

1. Classical Āyurvedic formulations and
2. Patent/Proprietary formulations made of herbal extracts.

The first group of formulations will have classical reference and the second group are the patent medicines.

The annual turnover of around 8400 licensed Āyurvedic pharmaceutical industries in India is approximately 4000 crores. This accounts for nearly a third of the India's pharmaceutics business. All this huge commercialization poses many challenges about safe use of Āyurvedic medicines, enforcing the need for pharmacovigilance programmes in our field.

However, average number of ADRs reported monthly/annually to National Pharmacovigilance Program (NPVP) in India is quite demoralizing. Such low number of ADR reports does not even come good for statistical calculations.

- The obvious reasons behind this might be;
- The strong belief among the prescribers and the consumers of Āyurvedic drugs and formulations that they are safe in all conditions.
- Absolute ignorance about pharmacovigilance among Āyurvedic practitioners;
- improper establishment of pharmacovigilance as a system in India;
- No specific channel to mobilize the ADR reports from grass root level to higher authorities/regulatory bodies.

**Challenges in introducing pharmacovigilance in Āyurveda:**

The NPVP has encouraged reporting of all the suspected drug-related adverse events including those caused by herbal/traditional/alternative medicines (Protocol of NPP, Version 1,2004, p. 17); but the number of reports related to Āyurvedic/herbal drugs has been depressingly low. Several challenges that prohibit identification and reporting of ADR to Āyurvedic drugs can be identified related to;

1. Detection of adverse reactions
2. Assessment of adverse reactions
3. Prevention of adverse reactions

**Detection of adverse reactions: (ADRs)**

The firm conviction among prescribers as well as the consumers about the safety of Āyurvedic medicine makes it all difficult throughout the process of doctor patient contact to detects the Adverse Drug Reactions (ADRs).

- The concept and terminologies related to ADR monitoring—not covered in Āyurvedic curriculum.
- Drug safety study methods presently available are inadequate.
- Information related to medicines in the stanzas of classical texts is not easily accessible.
- Lack of reporting and collection of reports related to any information.
- The process of DR assessment gets too much complicated when patient concurrently consumes medicines of different systems.
- Another mystifying factor in diagnosing the ADRs is the lack of quality assurance and control over many of the Āyurvedic medicinal products.
- Identifying Āyurvedic medicines coming from any of the informal small-scale manufacturing and selling sectors is many times beyond possibility and the ADRs associated with these medicines are even more difficult to be assessed.
- Example from a pharmacovigilance centre:
  Usually the tastings for Āyurvedic drugs/formulations to assess ADRs are done for adulteration of steroids in them. Out of 154 such requests in past 5 years, labelled with exact ingredients were only 22 formulations; the remaining 132 were from the informal sector, dispensed by the doctors. The problem of fake and spurious drugs is more serious than we think. Another quite worrying trend is the camouflaged allopathic medicines as Āyurvedic drugs.

**Assessment of ADRs to Āyurvedic medicines:**

The available parameters for assessing ADRs are quite inadequate with many challenges posed;

- The available information of ADRs scattered in classical books is hardly accessible as it is not in electronic form.
- Many of the Āyurvedic publications are not peer-reviewed journals and the quality is unconvincing.
- Majority of Āyurvedic formulations are multi-ingredient with fixed dosage and are rarely prescribed alone.
- The fact of patients consuming medicines of different systems concurrently is quite misleading.

- As a result it leads to highly complex pharmaco-kinetics and toxico-kinetics.
- Dose related responses are seldom measured and reported.
- Even with de-challenge and re-challenge no objective evidence of the adverse events is traced.
- Lack of expertise in performing cause and effect analysis with Āyurvedic products.

Presently persons trained in pharmacovigilance rarely understand Āyurveda and experts of Āyurveda are not trained in the science of pharmacovigilance.

**Prevention of ADRs to Āyurvedic medicines:**

The success of any pharmacovigilance system lies in the fact of preventing further more ADRs quite successfully by making use of available information documented and analyzed. The challenges ramify here with Āyurvedic medicines;

- Poor communication between practitioners and policy makers of orthodox western medicine and traditional Indian medicine.
- The current NPVP in India does not have Āyurveda under its fold.
- Therefore, Āyurvedic practitioners are unaware about the need to report the ADRs.
- No formalized channel to report the ADRs is known to us, so the question of where and whom to report pops up.
- Misconception about full safety of Āyurvedic medicine leads many patients to consume them for years without any monitoring.
- So the patients may also ignore to give the history of taking these medicines.
- UG and PG level teaching of any medicinal system lacks the pharmacovigilance in their curriculum.
- So the younger generation remains completely unaware of the concept of pharmacovigilance and ADRs.
- The pharmaceutical industries are not motivated to focus on pharmacovigilance; especially Āyurvedic industries.
- So there is rarely an effort to generate safety data—either pre or post marketing of a medicinal product.
- More than 100 referral books; over 100000 formulations; many books out of print and in frail condition; makes it all more complicated.
- AFI quotes over 630 formulations in its two published volumes.
- The formulations from informal sector are huge and immeasurable.
- Which medicine to include in the pharmacovigilance system.

**Recommendations:**

Based on the above observations, there are several ways one can move ahead in attempting to embrace pharmacovigilance system into Āyurveda;

- Introduce pharmacovigilance concept into the curriculum of Āyurveda at UG and PG levels.
- Encourage studies on drug safety.
- Make reporting of ADRs to regulators, mandatory for Āyurvedic formulations.
- Make unbiased and easily accessible drug information available through all possible sources.
- The traditional knowledge digital library is a good attempt by Indian Government to make the books digitally accessible.
- Create awareness about the science of pharmacovigilance among Āyurvedic physicians, patients and paramedical staff.
- Development and validation of scales to assess the cause-effect of the reported reactions to Āyurvedic medicines.
- Human resource development is the key feature for the success of this enterprise.
- It will be necessary to train Āyurveda experts in the science of pharmacovigilance and include them in assessment and reporting of adverse reactions.
- Direct involvement of Āyurvedic academic institutions in the NPVP after appropriate training would be the first step.
- Joint efforts from experts in pharmacovigilance and Āyurveda can ensure the system is functioning.
- Pharmacovigilance in Āyurvedic medicines is perhaps an unthought-of of concept yet; however, we do not need any Āyurvedic thalidomide to wake the pharmacovigilance community.

**Obligations of the pharmaceutical companies:**

- No degree of care and caution at the pre-clinical and clinical testing stages can ensure an absolute safety when a product is marketed and prescribed in large populations with settings different from the clinical trials.
- Thus a strong pharmacovigilance system is required to ensure the continuous monitoring and evaluation of the new safety data generated under the real world conditions on the effects, side effects, contraindications, drug reactions, new indications and use in new populations of all drugs.

- Indian market has mostly seen the launch of only those products that have been already approved and marketed in the regulated markets of USA, Europe, Japan or some other countries.
- For assessing the benefit risk profile of a drug and to take appropriate corrective actions, the Indian pharmaceutical companies as well as Indian regulatory bodies have been depending on the experiences gained from the those markets where the drug was being used for several years before introducing in India, thus bypassing the requirement to establish a strong pharmacovigilance system of their own.
- In recent years many companies are investing heavily in research and development and enhancing their capacity to develop and market new drugs on their own research efforts.
- Moreover India is becoming a hub for clinical research activities due to its large populations, high enrolment rate and low cost.
- Furthermore the lag period a drug is placed for the first time in the markets of USA, Europe, Japan or somewhere else in the world, and its subsequent availability in Indian markets is considerably decreased.
- Because of such drugs long-term safety data is not available at the time of their launch in India. In such cases the Indian regulatory agencies cannot count on the experiences of other markets to assess the benefit- risk balance of the drug. So they need to develop on their own adequately designed pharmacovigilance system in India.
- The DGCI—Drug Controller General of India and the leading pharmaceutical companies under the guidelines of WHO are thinking strongly on the inadequacies of pharmacovigilance in India.
- But for an effective pharmacovigilance system to be functional and efficient, all the stakeholders need to be sincerely alert and attentive throughout the life cycle of a medicinal product in the market.
- The DGCI is implementing a programme called NPP—National Pharmacovigilance Programme in India.
- Schedule Y of the DCA-1945 which speaks about the drug safety was thoroughly amended on 20th Jan 2005 to include elaborate pharmacovigilance obligations for the companies attempting to manufacture and market new drugs in India.

**Schedule Y:**

The schedule deals with regulations relating to;

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- The preclinical and clinical studies for development of new drugs.
- Clinical trial requirements for any import of drugs.
- Manufacture and obtaining marketing approvals for a new drug in India.
- Continues commitment of DGCI to ensure adequate compliance of pharmacovigilance obligations of the pharmaceutical companies.
- Define the better responsibilities of the pharmaceutical companies for their marketed products as well as relating to the reporting of adverse events from clinical trials.

The post marketing surveillance includes regular submission of PSURs (Periodic Safety Update Reports) which are crucial in ADR assessmen.

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# U. G. SYLLABUS

## RASAŚĀSTRA & BHAIṢAJYA KALPANĀ- Paper I

(As per CCIM, New Delhi)

### PART- A

1. Definition and etymology of Rasa, History of Rasaśāstra, Importance of Rasauṣadhi, Concept of Rasa-Rasāyana, Concept of Raseśwara Darśana. Concept of Rasaśālā and Rasamaṇḍapa.
2. Brief description and application of technical terminologies (Paribhāṣā): Āvāpa, Nirvāpa, Ḍhālana, Bhāvana, Jāraṇa, Mūrcchana, Śodhana, Māraṇa, Amṛtīkaraṇa, Lohitīkaraṇa, Mṛta Loha, Sattwa Pātana, Druti, Apunarbhava, Niruttha, Rekhāpūrṇa, Vāritara.
3. Dravya varga: Amlavarga, Pañcamṛttikā, Pañcagavya, Pañcāmṛta, Kṣārāṣṭaka, Drāvaka gaṇa, Mitra pañcaka, Rakta varga, Lavaṇa pañcaka.
4. Brief description of Yantra and their application Ulūkhala yantra, Khalwa yantra, Kacchapa yantra, Ḍamaru yantra, Vidyādhara yantra, Ūrdhwapātana, Adhaḥpātana & Tiryakpātana yantra, Jāraṇārtha Tulāyantra, Dolā yantra, Pātāla yantra, Pālikā yantra, Vālukā yantra, Bhūdhara yantra, Sthālī yantra, Swedana yantra.
5. Brief description & application of Mūṣā (Crucible): Sāmānya mūṣā, Gostanī mūṣā, Vajra mūṣā, Mahā mūṣā, Yoga mūṣā, Vṛntāka mūṣā, Malla/ Pakwa mūṣā. Different types of crucibles e.g. Silica crucible, Platinum crucible. Mudrā and Sandhi-bandhana.
6. Brief description & applications of Chullikā, Sattwapātana koṣṭhī, Pātāla koṣṭhī, Gāra koṣṭhī, Aṅgāra koṣṭhī and knowledge of various heating appliances viz. Gas stove, Hot plate, Heating mantle, Induction stove, Hot air oven.
7. Concept, definition and types of Puṭa: Sūrya puṭa, Candra puṭa, Gomaya puṭa, Lāvaka puṭa, Kukkuṭa puṭa, Kapota puṭa, Varāha puṭa, Gaja puṭa, Mahā puṭa, Kumbha puṭa, Vāluka puṭa, Bhūdhara puṭa, Applications of Electric muffle furnace and fuel (diesel) dependent furnace. Brief introduction to thermocouple and pyrometer.
8. Knowledge of Pārada: Synonyms, Occurrence, natural and artificial sources of Pārada, Hiṅgulottha pārada, Types of pārada, Pārada doṣa: Naisargika, Yougika, Aupādhika (kañcuka); Grāhyāgrāhya pārada, Pāra-

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da gati, Pārada bandha, Śodhana of pārada. Pārada saṁskāra and brief description of Aṣṭa-saṁskāra.

9. Concept of Pārada mūrcchana and jāraṇa; Preparation of Kajjalī, Classification of Rasauṣadhī: Khalvī rasa: Tribhuvanakīrti rasa; Parpaṭī rasa: Rasa parpaṭī, Kūpīpakva rasa: Rasa-sindūra, Poṭṭalī rasa: Hemagarbha poṭṭalī rasa. Rasa sevana-vidhi and pathyāpathya.
10. Brief introduction of quality control, Standardization and GMP of Rasauṣadhis;

## PART- B

Occurrence, Synonyms, minerological identification, sources, types, grāhyāgrāhyatwa, śodhana, māraṇa and other processing techniques; properties, dose, anupāna and therapeutic uses; pathya- apathya; aśuddha, apakwa and avidhī sevanajanya doṣa and its management of the following important drugs/formulations:

1. Mahārasa- Abhraka (Biotite mica), Vaikrānta, Mākṣika (Chalco pyrite), Vimala (Iron pyrite), Śilājatu, Sasyaka (Peacock ore), Capala and Rasaka (Sphalerite).
2. Uparasa- Gandhaka (Sulphur), Gairika (Red ochre), Kasīsa (Green vitriol), Kāṅkṣī (Alum), Haratāla (Orpiment), Manaḥśilā (Realgar), Añjana and Kaṅkuṣṭha.
3. Sādhāraṇa Rasa- Kampillaka, Gaurīpāṣāṇa (Arsenic oxide), Navasādara (Ammonium chloride), Kaparda (Cowry), Agnijāra, Girisindūra (Red oxide of Hg), Hiṅgula (Red cinnabar) and Mṛddāraśṛṅga (Litharge).
4. Dhātu- Swarṇa (Gold), Rajata (Silver), Tāmra (Copper), Loha (Iron), Vaṅga (Tin), Nāga (Lead), Yaśada (Zinc), Kāṁsya (Bronze), Pittala (Brass), Vartaloha.
5. Ratna- Māṇikya (Ruby), Muktā (Pearl), Pravāla (Coral), Tārkṣya (Emerald), Puṣparāga (Topaz), Vajra (Diamond), Nīlama (Sapphire), Gomeda (Zircon or Cinnamone stone), Vaiḍūrya (Cats eye). Ratna-parīkṣā, Ratna doṣa.
6. Uparatna- Vaikrānta (Tourmaline), Sūryakānta (Sun stone), Candrakānta (Moon stone), Rājāvarta (Lapis lazuli), Perojaka (Turquise), Sphaṭikamaṇi (Quartz), Tṛṇakānta, Pālaṅkya, Pūtikā, Rudhira.
7. Sudhā varga- Sudhā (Lime stone), Kaparda (Cowries), Śukti (Oyster shell) , Śaṅkha (Conch shell), Mṛgaśṛṅga (Stag horn), Khaṭikā, Godantī (Gypsum) and Samudraphena (Cattle fish bone), Kukkuṭāṇḍa twak (Hen's egg shell).

8. Sikatā varga- Sikatā (Silica), Dugdhapāṣāṇa (Talc), Nāgapāṣāṇa/Jaharmoharā (Serpentine), Badarāśma (Silicate of lime ), Vyomāśma (Sangeyashab - Jade), Kouśeyāśma (Asbestos) and Ākīka (Agate).
9. Kṣāra varga- Sarja kṣāra (Sodium bicarbonate), Yava kṣāra, Ṭaṅkaṇa kṣāra (Borax), Sūrya kṣāra (Potassium nitrate).
10. Miscellaneous- Maṇḍūra, Bola, Damul akhawayan (Raktabandhinī), Kastūrī, Bhūnāga, Mayūrapiccha, Sarjarasa, Madhūcchiṣṭa.
11. Viṣa and Upaviṣa- Introduction, collection and storage, classification, synonyms, śodhana, antidote, therapeutic and toxic doses, anupāna, therapeutic uses, and formulations of following: Vatsanābha, Kucalā, Jayapāla, Dhattūra, Bhāṅga, Bhallātaka, Guñjā, Arka, Snuhī. Lāṅgalī, Karavīra, Ahiphena and Citraka mūla.
12. Auṣadhi yoga- Ingredients, manufacturing process, and therapeutic utility of—Ārogyavardhinī guṭikā, Kasturībhairava rasa, Kumāra kalyāṇa rasa, Garbhapāla rasa, Candraprabhā vaṭī, Candrāmṛta rasa, Pratāpalaṅkeśwara rasa, Pravāla-pañcāmṛta rasa, Ānandabhairava rasa, Yogendra rasa, Lakṣmīvilāsa rasa, Vasanta kusumākara rasa, Vasantamalatī rasa, Bṛhatvātacintāmaṇi rasa, Śaṅkha vaṭī, Śwāsakuṭhāra rasa, Hiṅguleśwara rasa, Hemagarbhapoṭṭalī, Hṛdayārṇava rasa, Swarṇavaṅga, Makaradhwaja, Puṭapakwa-viṣamajwarāntaka loha, Vātavidhvaṁsana rasa, Kāmadughā rasa, Laghusūtaśekhara rasa, Navāyasa loha, Saptāmṛta loha, Tāmra parpaṭī, Pañcāmṛta parpaṭī, Śweta parpaṭī.
13. Introduction to Pharamcovigilance and its status in India, with reference to Āyurvedic drugs.

## PRACTICALS

- Rasa (Pārada): Sāmanya śodhana of pārada, Kajjalī, Mugdha rasa.
- Mahārasa varga: Śodhana of Abhraka, Mākṣika, Śilājatu, Sasyaka; Dhānyābhraka nirmāṇa.
- Uparasa varga: Śodhana of—Gandhaka, Gairika, Kasīsa, Kāṅkṣī, Haratāla, Manaḥśilā Rasamāṇikya.
- Sādhāraṇa rasa varga: Śodhana of—Hiṅgula, Navasādara, Kapardikā.
- Sudhā varga: Śodhana of—Śaṅkha, Śukti, Pravāla mūla, Godantī.
- Dhātu varga: Sāmānya śodhana of Lauha; Śodhana of Maṇḍūra, Tāmra, Nāga, Vaṅga, Yaśada.
- Kṣāra varga: Śodhana of Ṭaṅkaṇa, Preparation of Rasaparpaṭī.
- Parpaṭī: Bola parpaṭī and Śweta parpaṭī.

- Viṣa varga: Śodhana of Vatsanābha, Bhallātaka, Kupīlū, Dhattūra bīja, Jayapāla, Guñjā, Citrakamūla.

## PRACTICAL FOR DEMONSTRATION/GROUP PRACTICAL

- Hiṅgulād-rasākṛṣṭi (Hiṅgulottha pārada)
- Bhasma : 4 (One from each group);
  - i. Abhraka bhasma, Swarṇa-makṣika bhasma, Tāmra bhasma
  - ii. Vaṅga bhasma, Nāga bhasma, Yaśada bhasma
  - iii. Maṇḍūra bhasma, Kāsīsa bhasma
  - iv. Śaṅkha bhasma, Kapardikā bhasma, Godantī bhasma
- Piṣṭi : 1 Pravāla piṣṭi, Jaharamoharā/Akīka piṣṭi, Tṛṇakānta piṣṭi, Muktā piṣṭi
- Druti : 1 Gandhaka druti
- Formulations : 4 (one from each group);
  - i. Rasasindūra, Swarṇa vaṅga, Samīrapannaga rasa
  - ii. Saptāmṛta lauha, Punarnavā maṇḍūra, Navāyasa lauha
  - iii. Agnituṇḍī vaṭī, Tribhuvana kīrti rasa, Sūtaśekhara rasa, Laghusūtaśekhara rasa
  - iv. Ārogyavardhinī vaṭī, Laghumālinīvasanta rasa, Hiṅguleśwara rasa, Ānandabhairava rasa, Rajaḥpravartinī vaṭī.

*

# P. G. SYLLABUS

## MD - ĀYURVEDA : RASAŚĀSTRA & BHAIṢAJYA KALPANĀ

### PAPER I

### RASAŚĀSTRA

**PART-A**

1. History and chronological evaluation of Rasaśāstra; Concept of Raseśwara darśana; Fundamental principles of Rasaśāstra; technical terms used in Rasaśāstra;
2. Detailed knowledge of ancient and contemporary yantropakaraṇa (instruments/machineries) and their accessories used in 'auṣadha nirmāṇa' and their contemporary modifications such as yantra, mūṣā, puṭa, koṣṭhī, bhrāṣṭrī, muffle furnace and other heating appliances such as ovens, driers etc; used in manufacture of 'Rasauṣadhis' both in small and large scale along with their applications.
3. Study of Saṁskāra, role of agni (heat), jala (water), and other dravya (liquids), kāla (season), pātra (container) etc; and their significance in 'auṣadha nirmāṇa'.
4. Concept of 'bhāvanā', study of 'mardana' and its significance; knowledge of ancient and contemporary grinding techniques.
5. Detailed knowledge of different procedures of śodhana, jāraṇa, mūrcchana and māraṇa; concept of puṭa, definition, types and specifications of different puṭas. Significance of different puṭas in relation to bhasmīkaraṇa and therapeutic efficacy of dravya under process. Bhasma parīkṣā-vidhi and its significance in relation to contemporary testing procedures. Amṛtīkaraṇa and lohitīkaraṇa.
6. Detailed knowledge of sattva and druti, sattva śodhana, mṛdukaraṇa and māraṇa of sattva, its significance, in relation to therapeutic efficacy of dravya under process.
7. Concept of pratinidhi (substitutes) dravya and discussion on controversial drugs.

**PART- B**

1. Detailed ancient and contemporary knowledge of pārada and its compounds with reference to source, occurance, physic-chemical character-

(c) Parpaṭī Rasa: Rasa parpaṭī, Loha parpaṭī, Tāmra parpaṭī, Swarṇa parpaṭī, Gagana parpaṭī, Vijaya parpaṭī, Pañcāmṛta parpaṭī, Śweta parpaṭī and Bola parpaṭī.

(d) Poṭṭalī Rasa: Rasagarbha poṭṭalī, Hemagarbha poṭṭalī, Mallagarbha poṭṭalī, Hiraṇyagarbha poṭṭalī, Śaṅkhagarbha poṭṭalī, Lokanātha rasa and Mṛgāṅka poṭṭalī.

(e) Loha & Maṇḍūra Kalpa: Ayaskṛtī, Loha rasāyana, Amlapittāntaka loha, Candanādi loha, Dhātrī loha, Navāyasa loha, Puṭapakwa-viṣama-jwarāntaka loha, Śilājitwādi loha, Tāpyādi loha, Saptāmṛta loha, Pradarāntaka loha, Rohitaka loha, Punarnavā maṇḍūra, Śatāvarī maṇḍūra, Triphalā maṇḍūra, Maṇḍūra vaṭaka etc;

(f) Knowledge of essential Āyurvedic drug list as prescribed by Dept. of AYUSH (Govt. of India) and its significance.

**PART-B**

Detailed knowledge of Bhaiṣajya Kalpanā Yoga (for Syllabus points of Paper-III, Part-B: Kindly refer Textbook of Bhaiṣajya Kalpanā).

## PAPER VI
## PHARMACOLOGY & PHARMACY MANAGEMANT

**PART-A**

1. General Pharmacology:
   (a) Principles of pharmacology, Pharmacodynamics & Pharmacokinetics: Absorption, distribution, Metabolism and excretion, mechanism of action, dose determination and dose response, structure activity relationship.
   (b) Routes of drug administration.
   (c) Factors modifying drug effect, Bioavailability and Bioequivalence, Drug interaction and adverse drug interaction and drug toxicity.
   (d) Preclinical evaluation—Experimental pharmacology (Bioassay, In vitro, In vivo, Cell line studies), Animal ethics.
2. Clinical pharmacology—Evaluation of New Chemical Entity- Phases and methods of Clinical research. Ethics involved in human research.
3. Elemental constituents of human body such as Iron, Copper, Zinc, Calcium, Manganese etc; and its physiological importance. Deficiencies and excess of various elements.
4. Toxicity of heavy metals and chelation therapy.

5. Knowledge of toxicity and pharmacological activities of herbo-mineral compounds.
6. Detailed knowledge of Pharmacovigilance—National and International Scenario. Pharmacovigilance of Āyurvedic drugs.

## PART-B

1. Scope and evolution of Pharmacy. Information resources in pharmacy and pharmaceutical Science.
2. Pharmaceutical information designing and dosage form design (pre-formulation).
3. Packaging material and Labeling.
4. Management of pharmacy, Store and inventory management, Personnel management, Good Manufacturing Practices (GMP), related to Āyurvedic Drug Industry.
5. Pharmaceutical marketing, Product release and withdrawals.
6. Hospital Dispensing and Community pharmacy.
7. Patenting and Intellectual Proprietary Rights.
8. Laws governing Āyurvedic drugs;
    - (i) Relevant regulatory provisions of Āyurvedic drugs in Drugs and Cosmetic Act-1940 and Rules- 1945.
    - (ii) Laws pertaining to Drugs and Magic Remedies (Objectionable Advertisement) Act-1954.
    - (iii) Prevention of Food Adulteration Act-2006.
    - (iv) Laws pertaining to Narcotics.
    - (v) Factory and Pharmacy Acts.
    - (vi) Consumer Protection Act-1986.
    - (vii) Knowledge of Good Clinical Practices and Inspection Manual prescribed by Dept. of AYUSH, Govt. of India.
9. Regulatory affairs related to International trade and practices of Āyurvedic drugs.
10. Introduction to Ayurvedic Pharmacopeia of India (API), Ayurvedic Formulary of India (AFI).
11. Introduction to Indian Pharmacopeia, British and US Pharmacopeia, Pharmacopeial Codex.
12. Introduction to Traditional Knowledge Digital Library.

## PRACTICAL

- Minimum 150 practicals to be performed covering all the dosage forms.

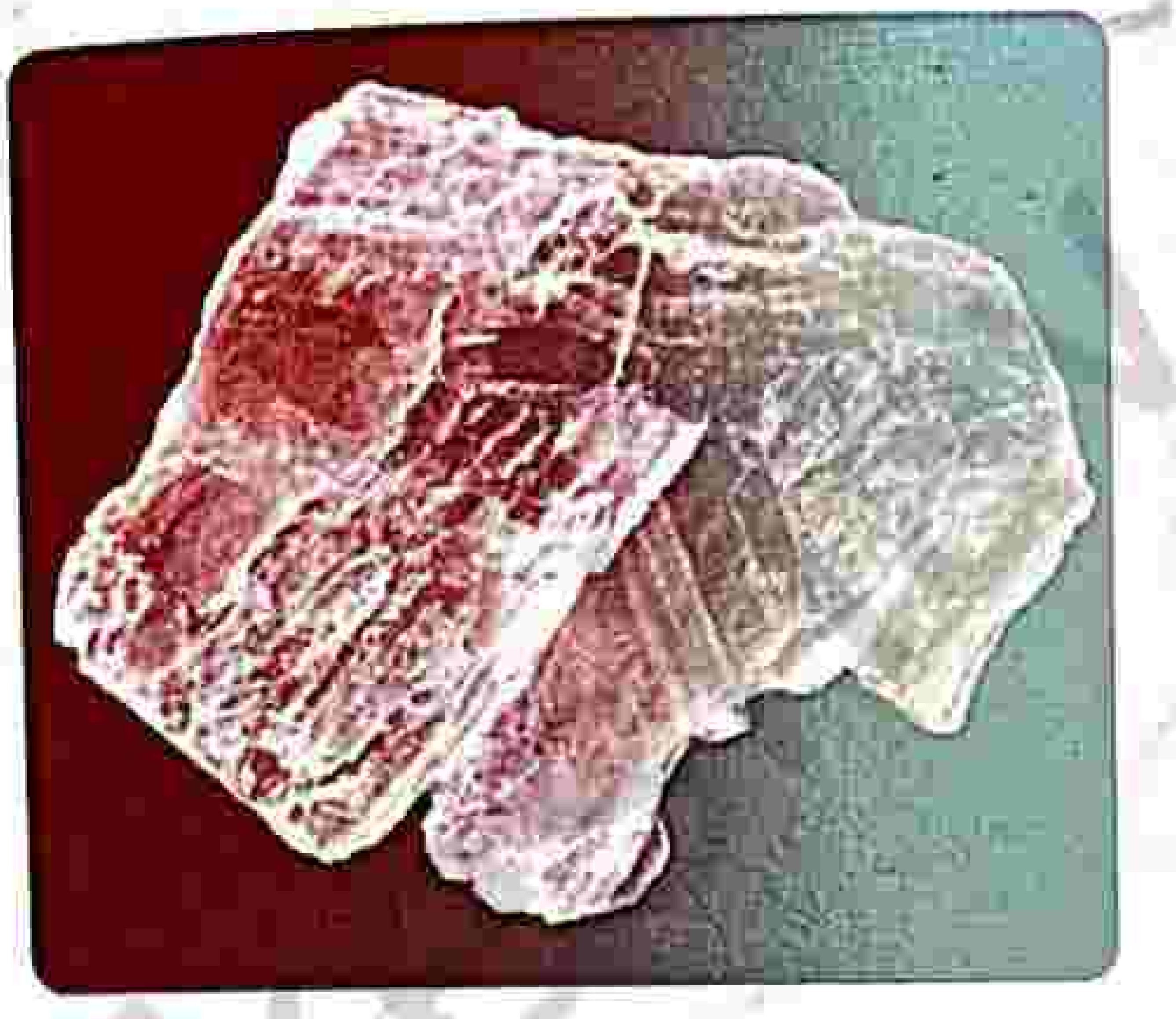
- Educational visits to minimum five (5) GMP approved Āyurvedic Pharmacies.
- Ten days posting in R&D/Production unit in Āyurvedic Pharmacy.
- Minimum attendance in three National Conferences within three academic years.
- Minimum ten clinical cases using different dosage forms are to be studied and recorded for efficacy and ADRs (if any).
- Minimum one research paper on the core contributory work of dissertation published or accepted in peer reviewed, indexed journal.
- Examinee has to submit supporting documents in relation to above mentioned academic activities at the time of Practical Examination.

*

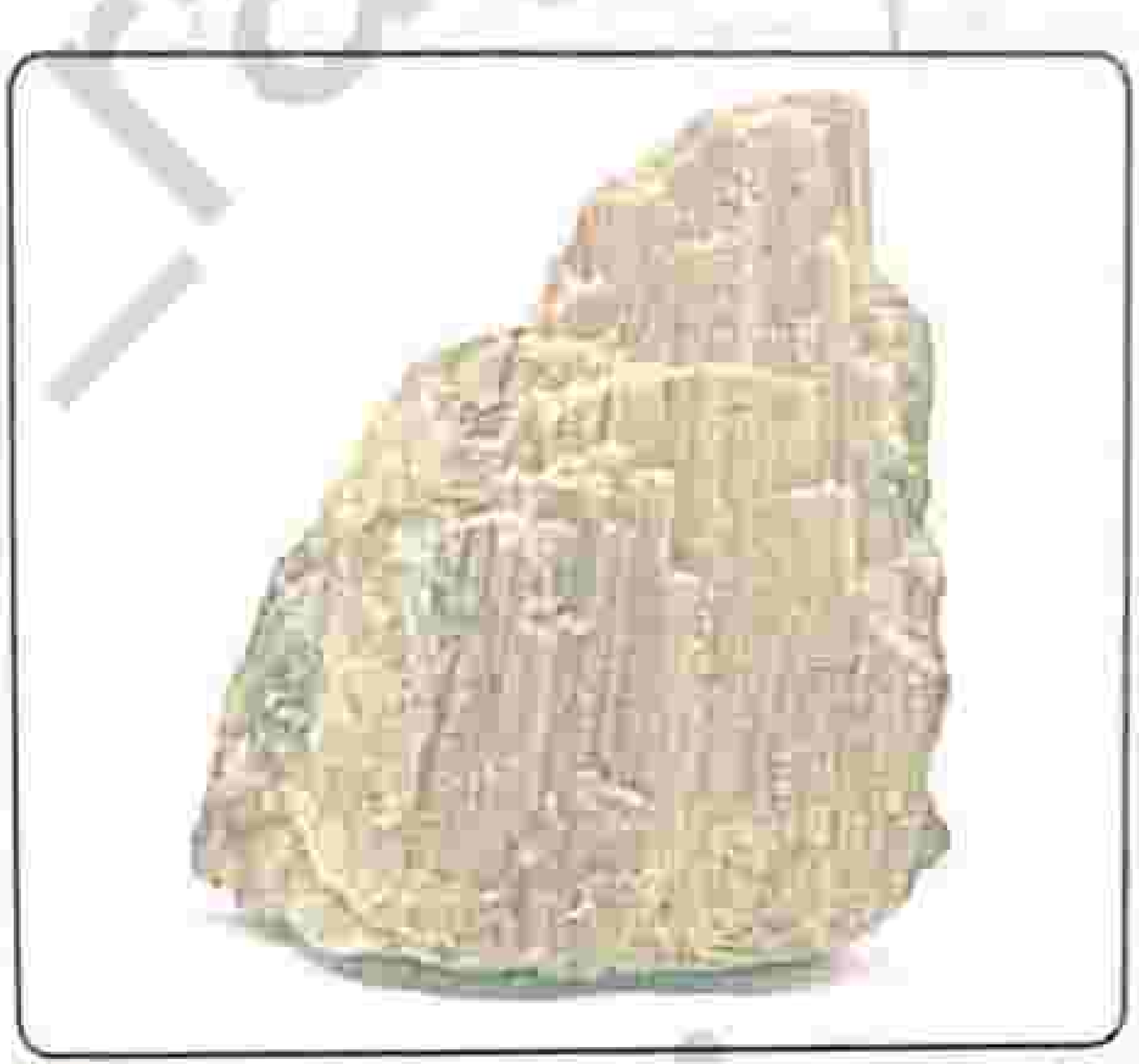
# Colour Plates of Rasa Dravyas

◆

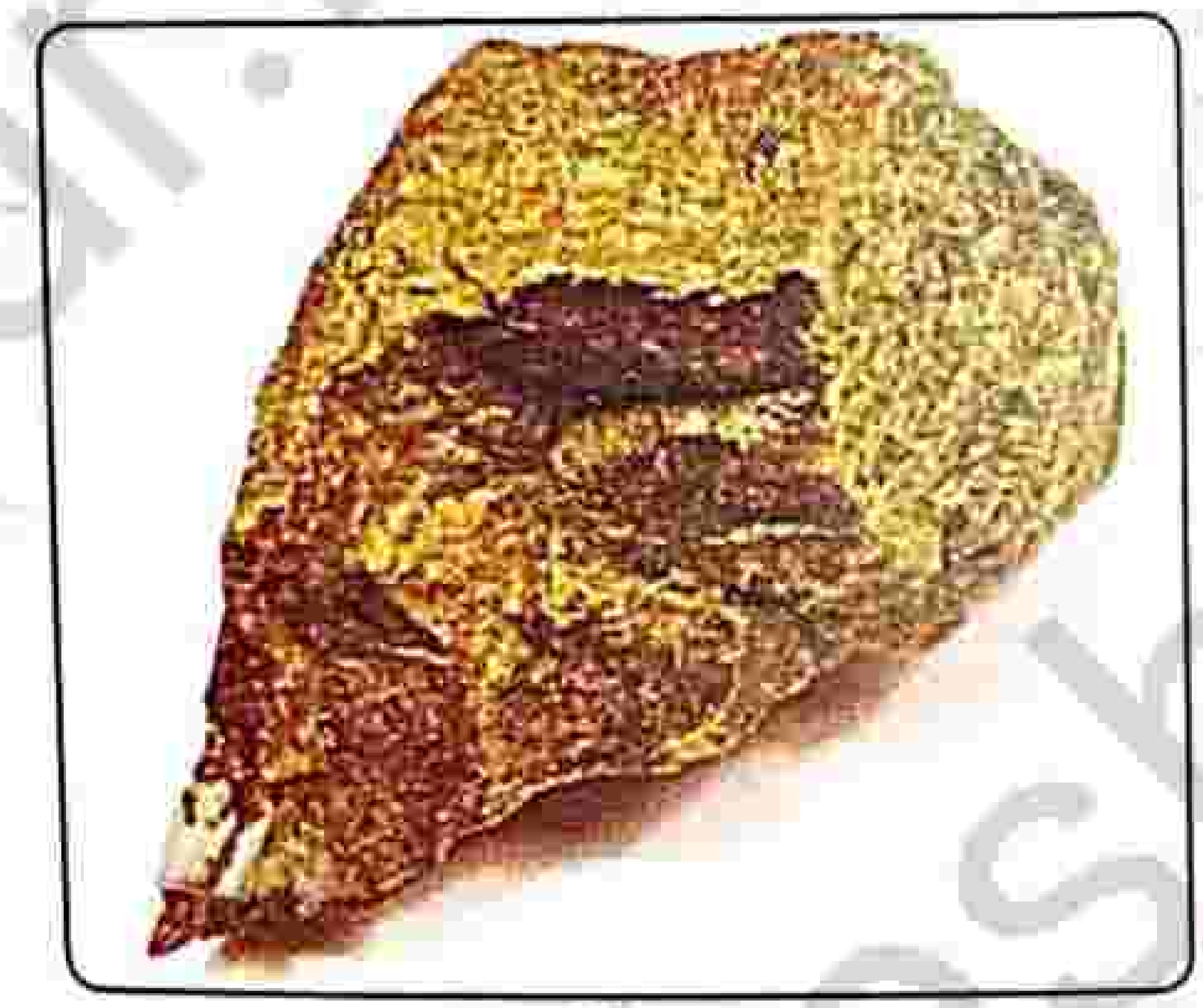
| | |
|---|---|
| ✦ MAHĀRASA | Plate 1-8 |
| ✦ UPARASA | Plate 9-16 |
| ✦ SĀDHĀRAṆA RASA | Plate 17-24 |
| ✦ DHĀTU VARGA | Plate 25-33 |
| ✦ RATNA VARGA | Plate 34-42 |
| ✦ UPARATNA VARGA | Plate 43-53 |
| ✦ SUDHĀVARGA DRAVYA | Plate 54-66 |
| ✦ SIKATĀVARGA DRAVYA | Plate 67-70 |
| ✦ KṢĀRAVARGA DRAVYA | Plate 71-74 |



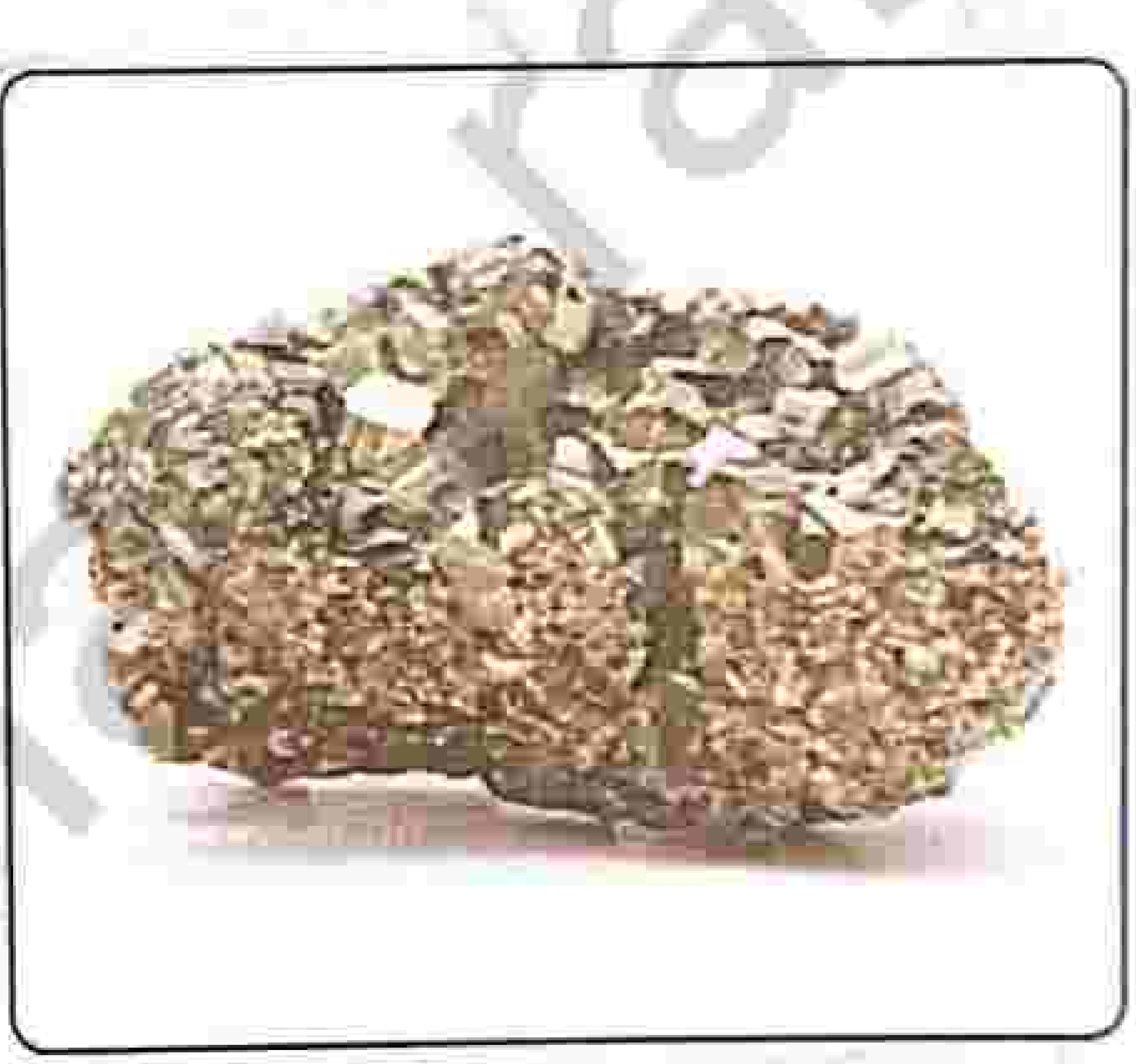
1. Abhraka (Mica)



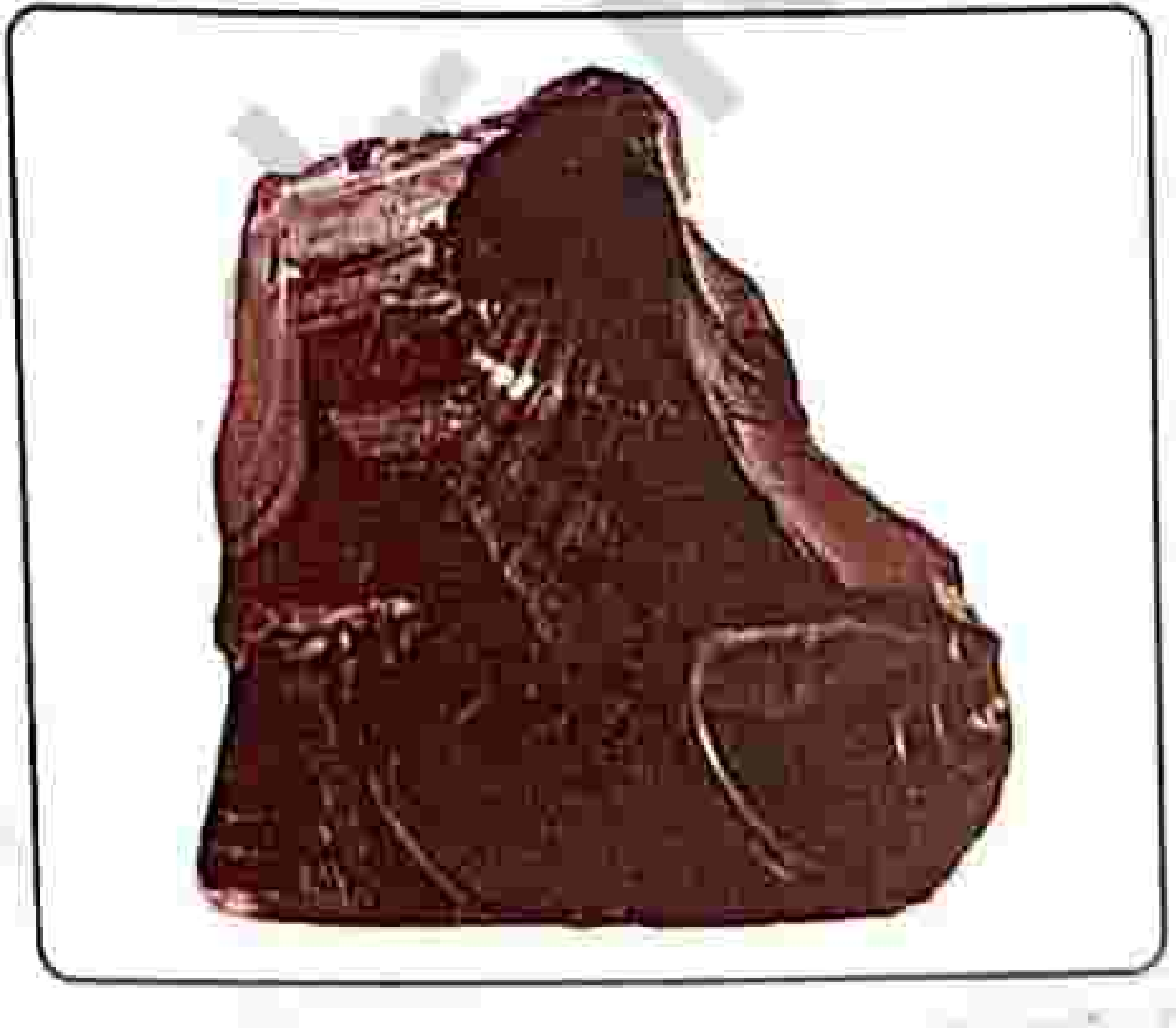
2. Vaikrānta (Tourmaline)



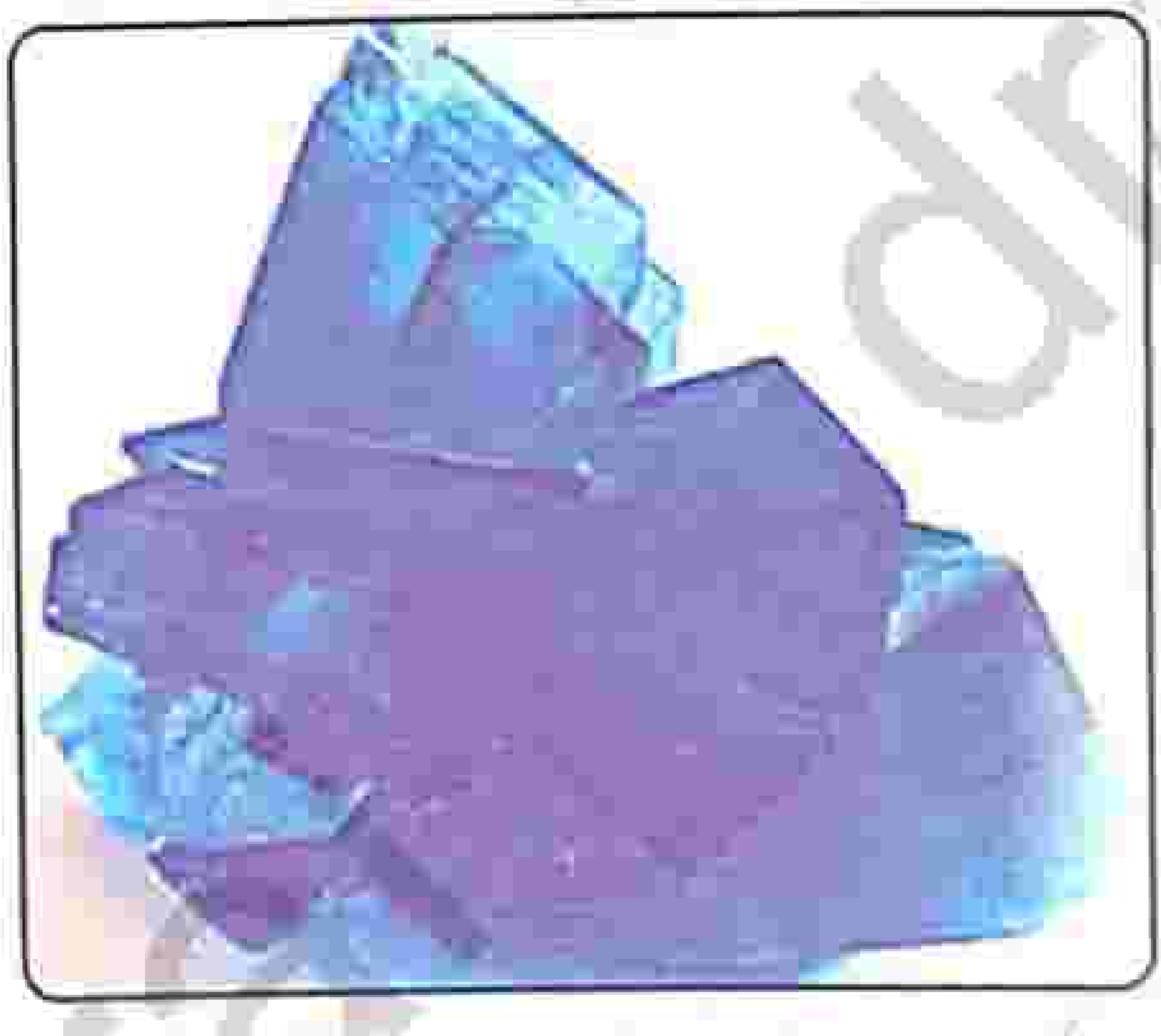
3. Mākṣika
(Copper pyrite or Chalcopyrite)



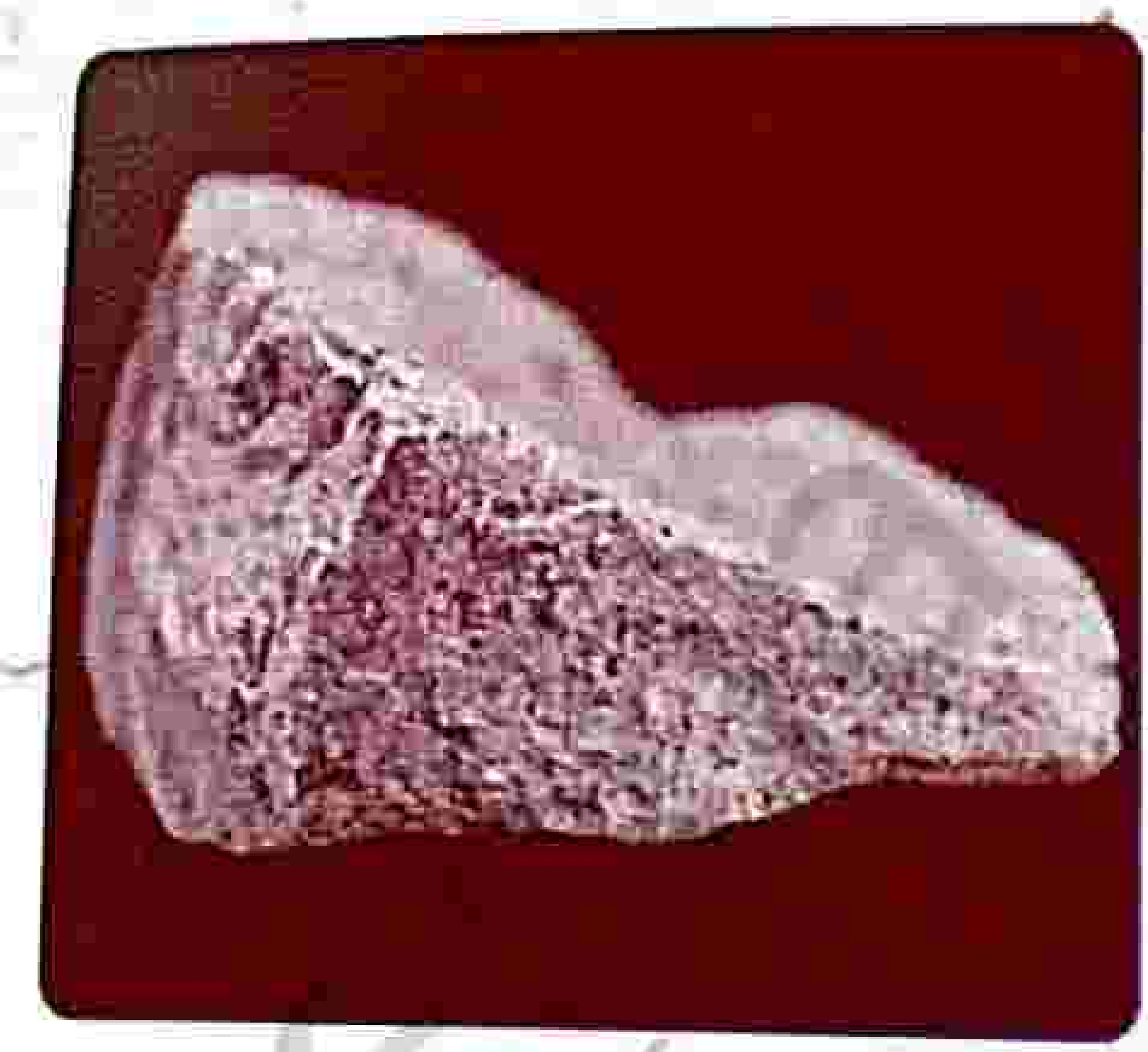
4.Vimala (Iron pyrite)

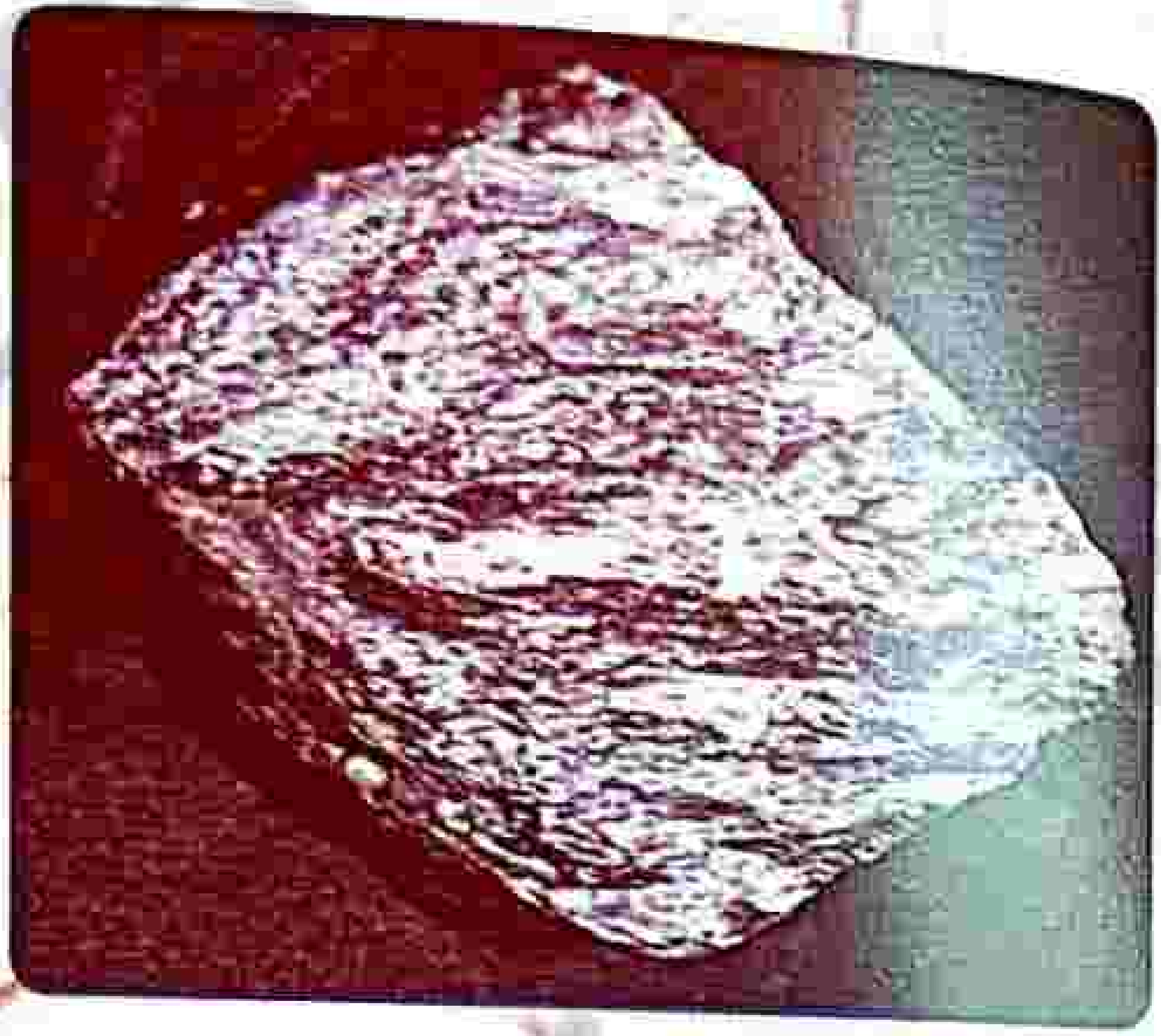


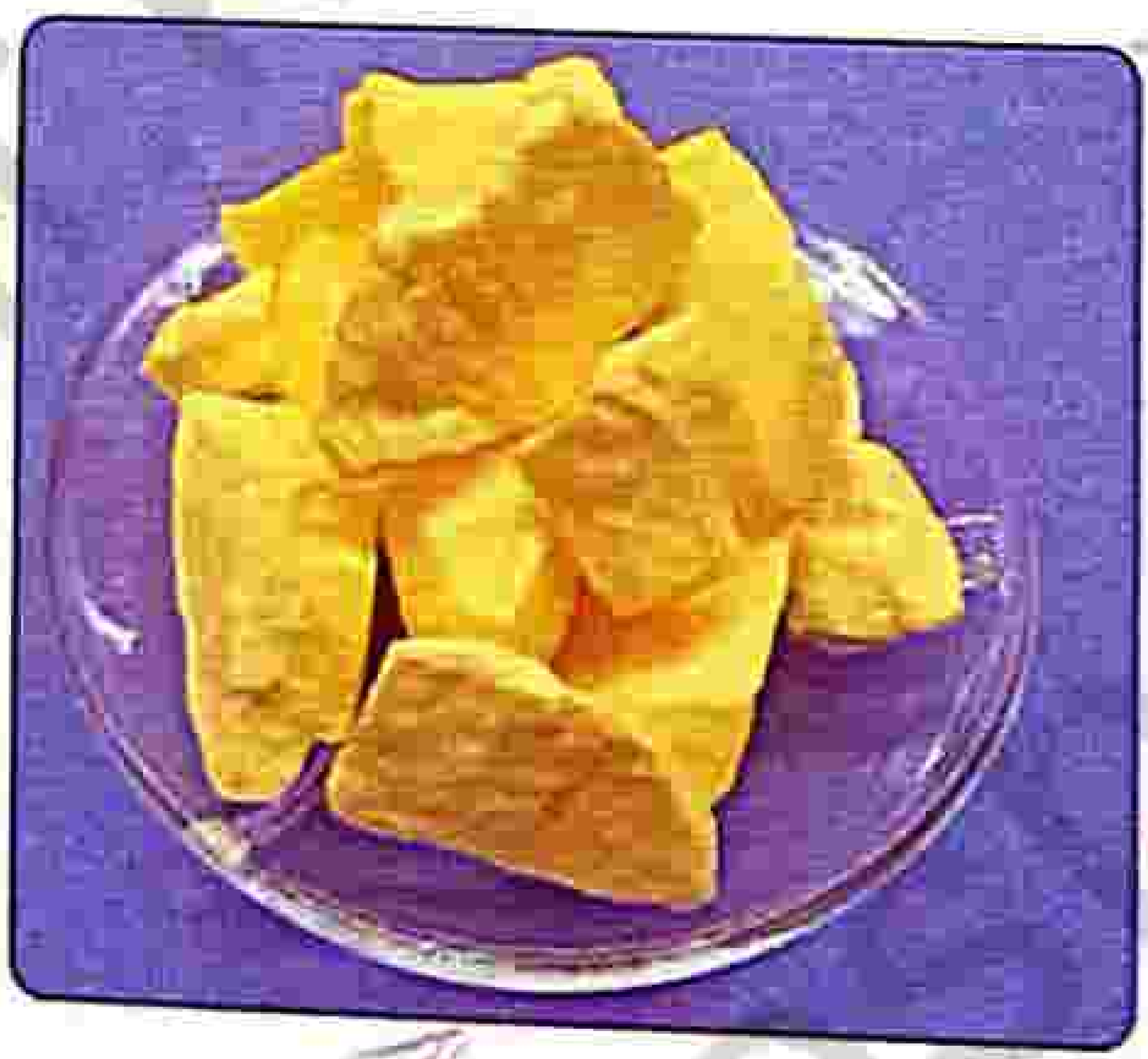
5. Śilājatu (Black bitumen)

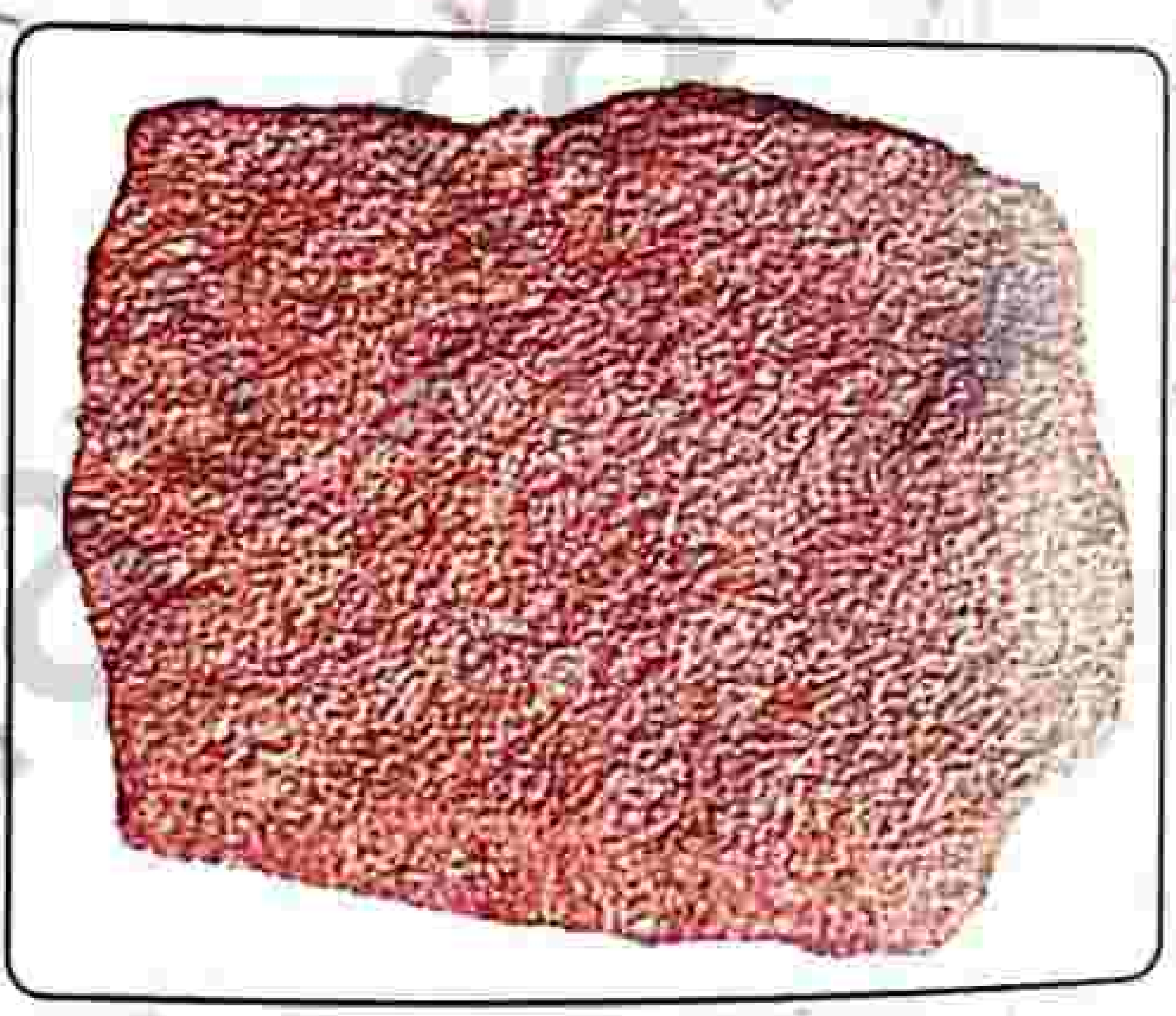


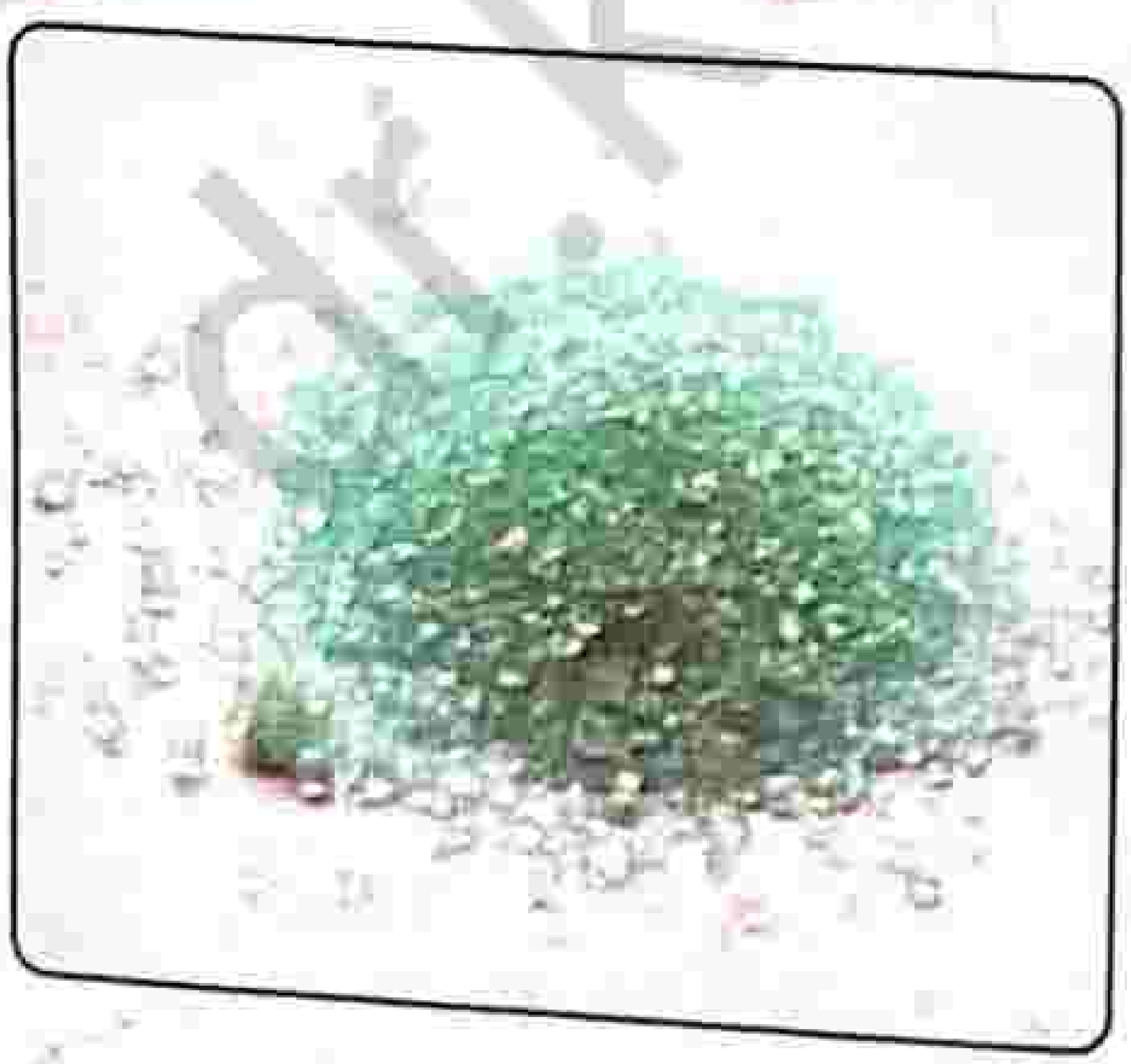
6. Sasyaka
(Tuttha; Copper sulphate)

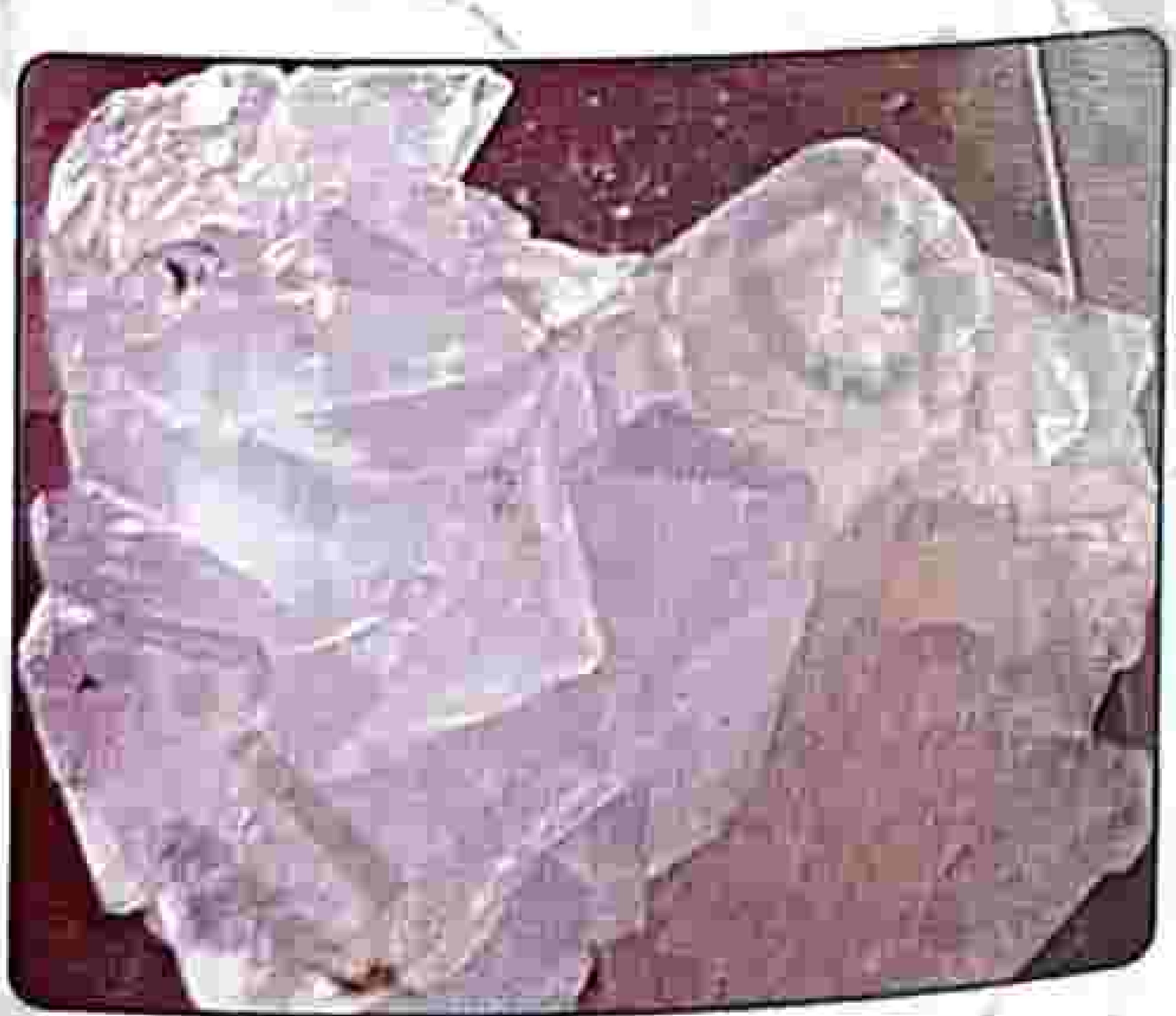

7. Capala (Selenium; Se)

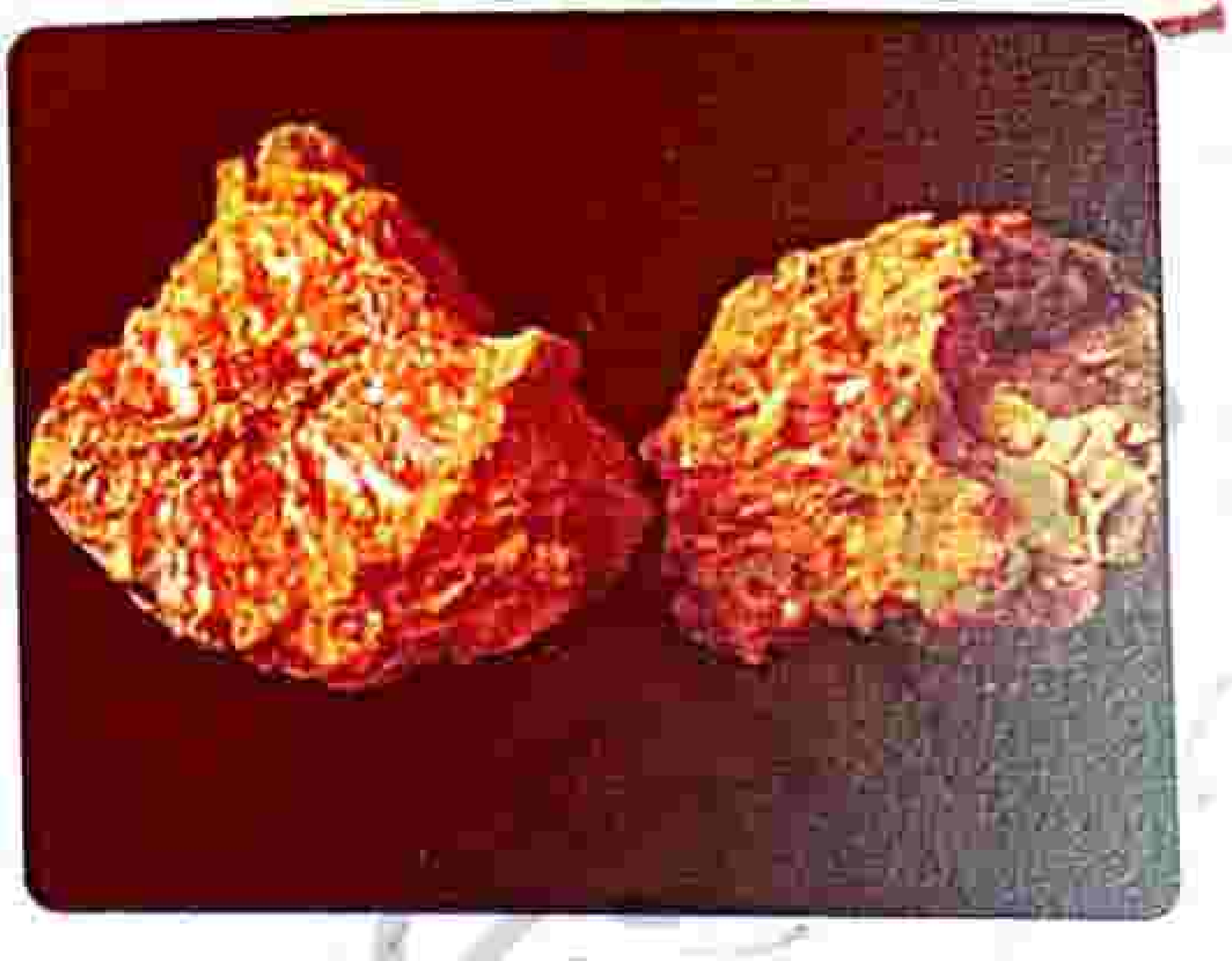

8. Rasaka (Kharpara; Zinc oxide)


9. Gandhaka (Sulphur)

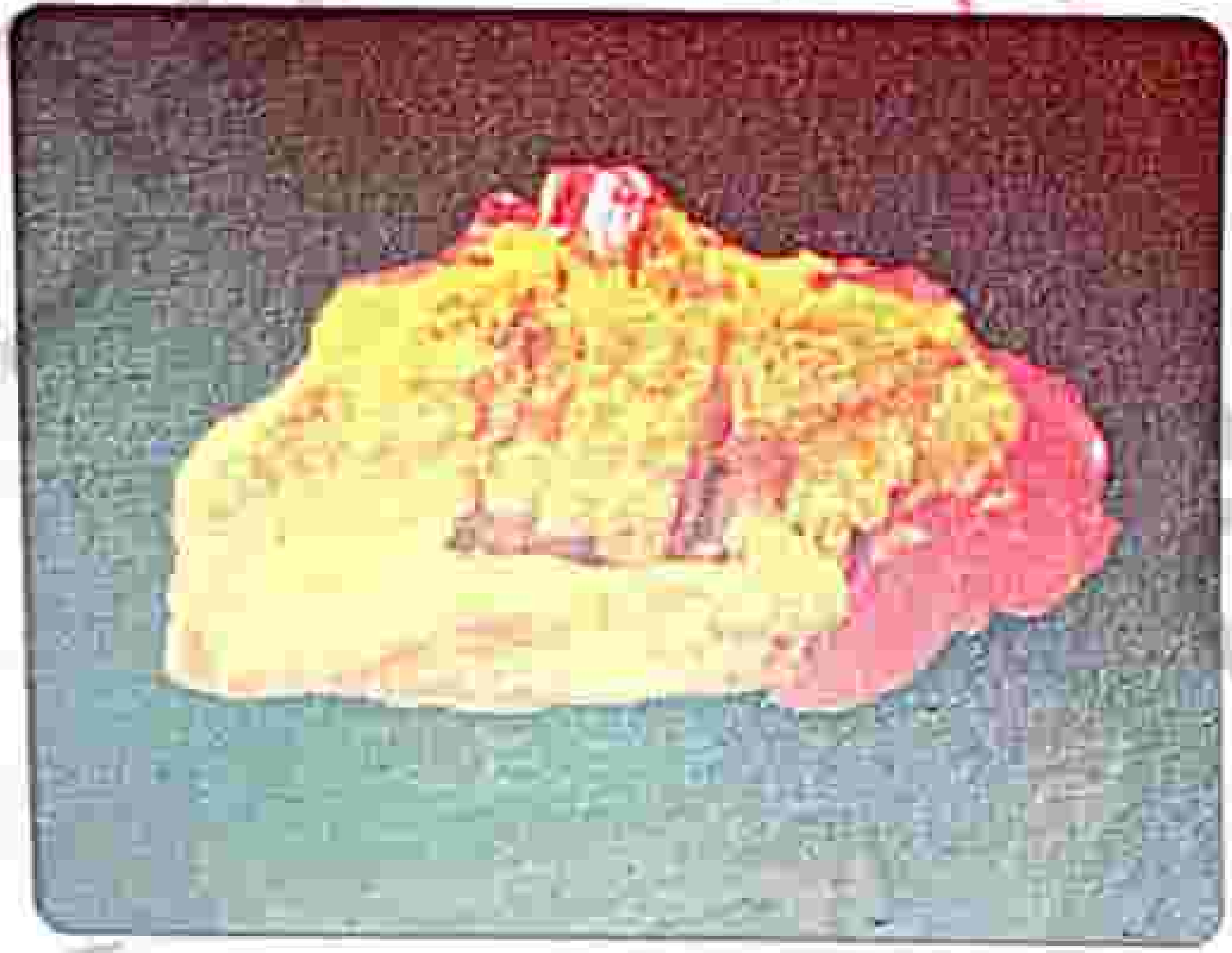

10. Gairika (Haematite)


11. Kāsīsa
(Green vitriol; Ferrus sulphate)

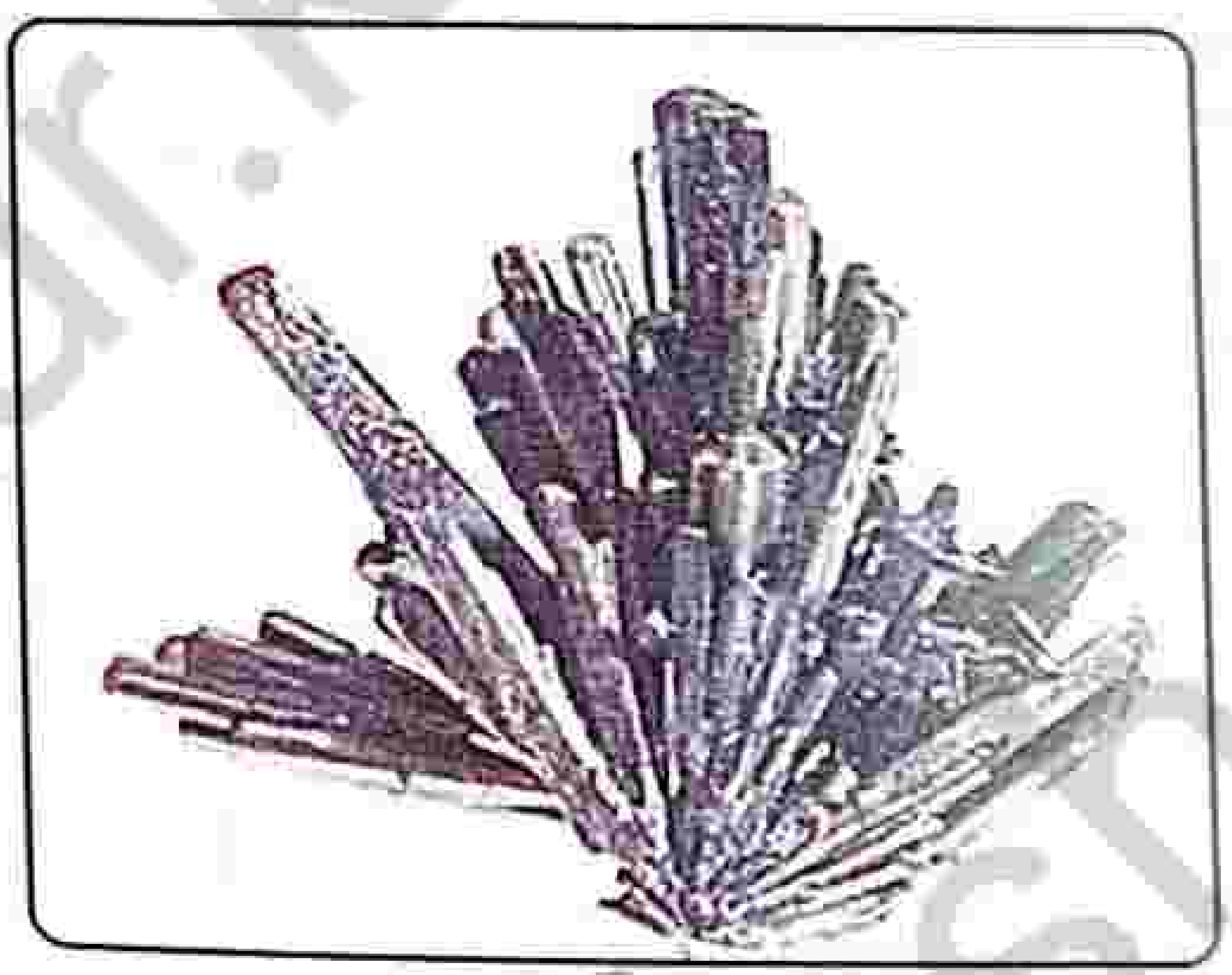

12. Sphaṭika (Potash alum)



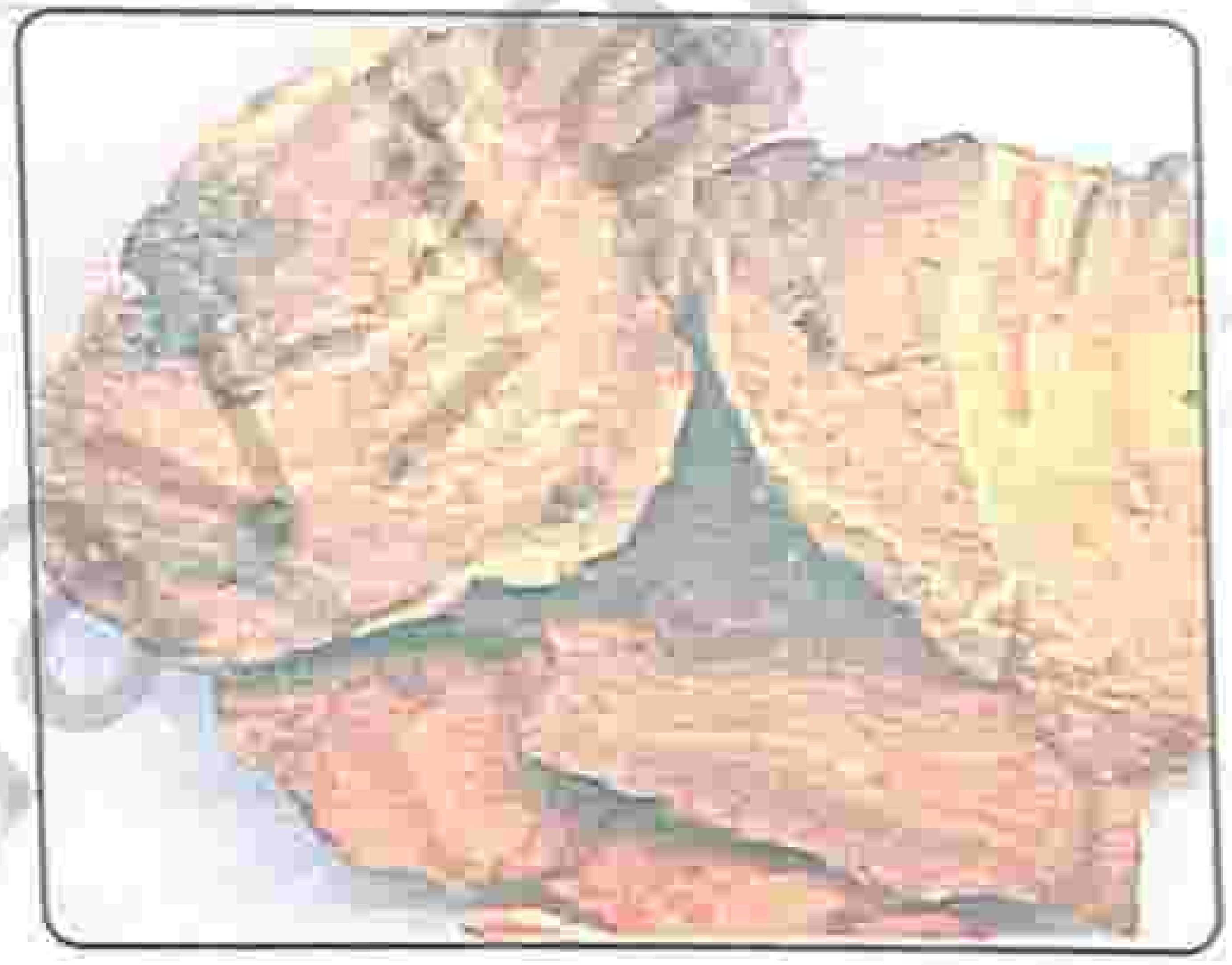
13. Haratāla (Arsenic trisulphide)



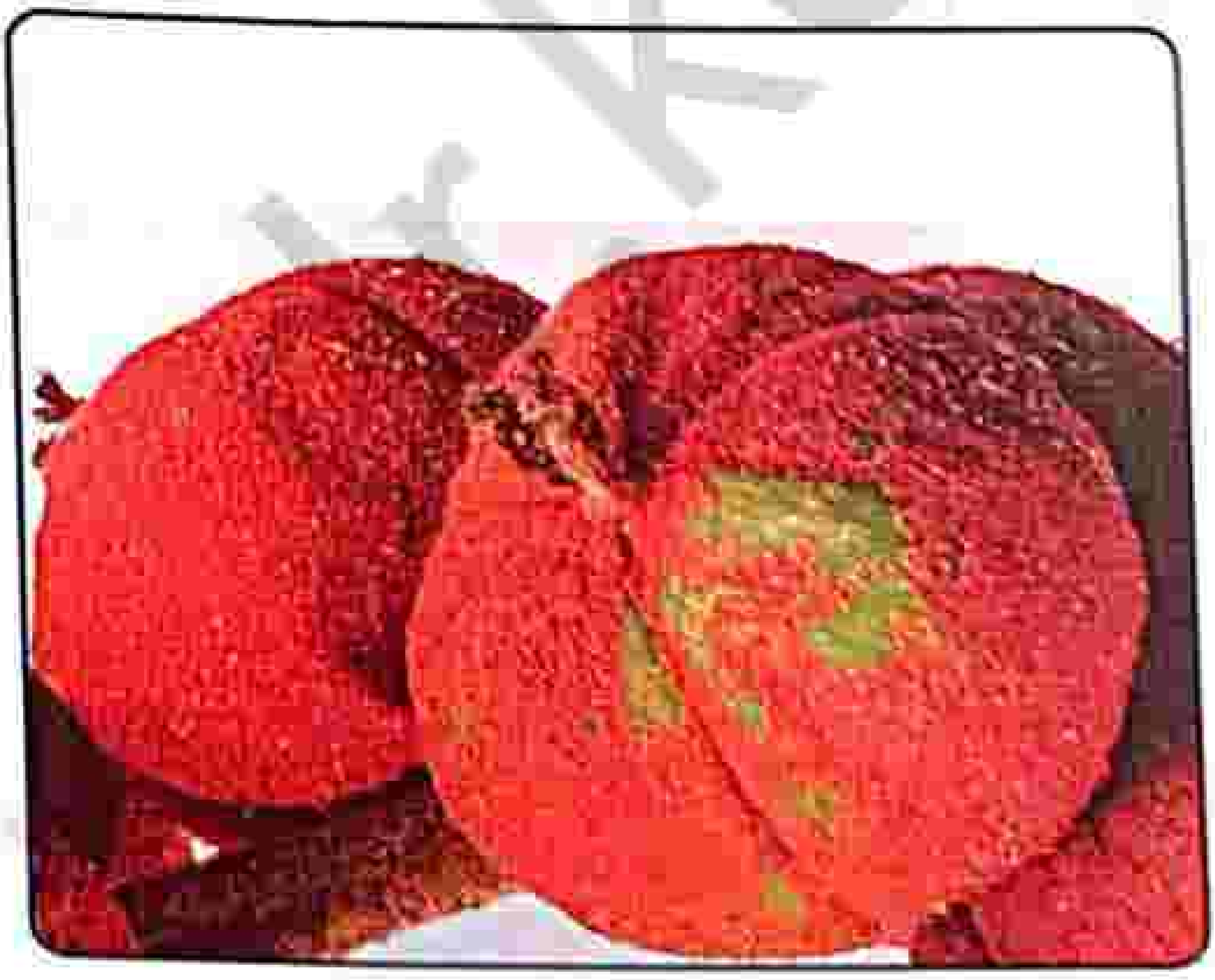
14. Manaḥśilā (Arsenic disulphide)



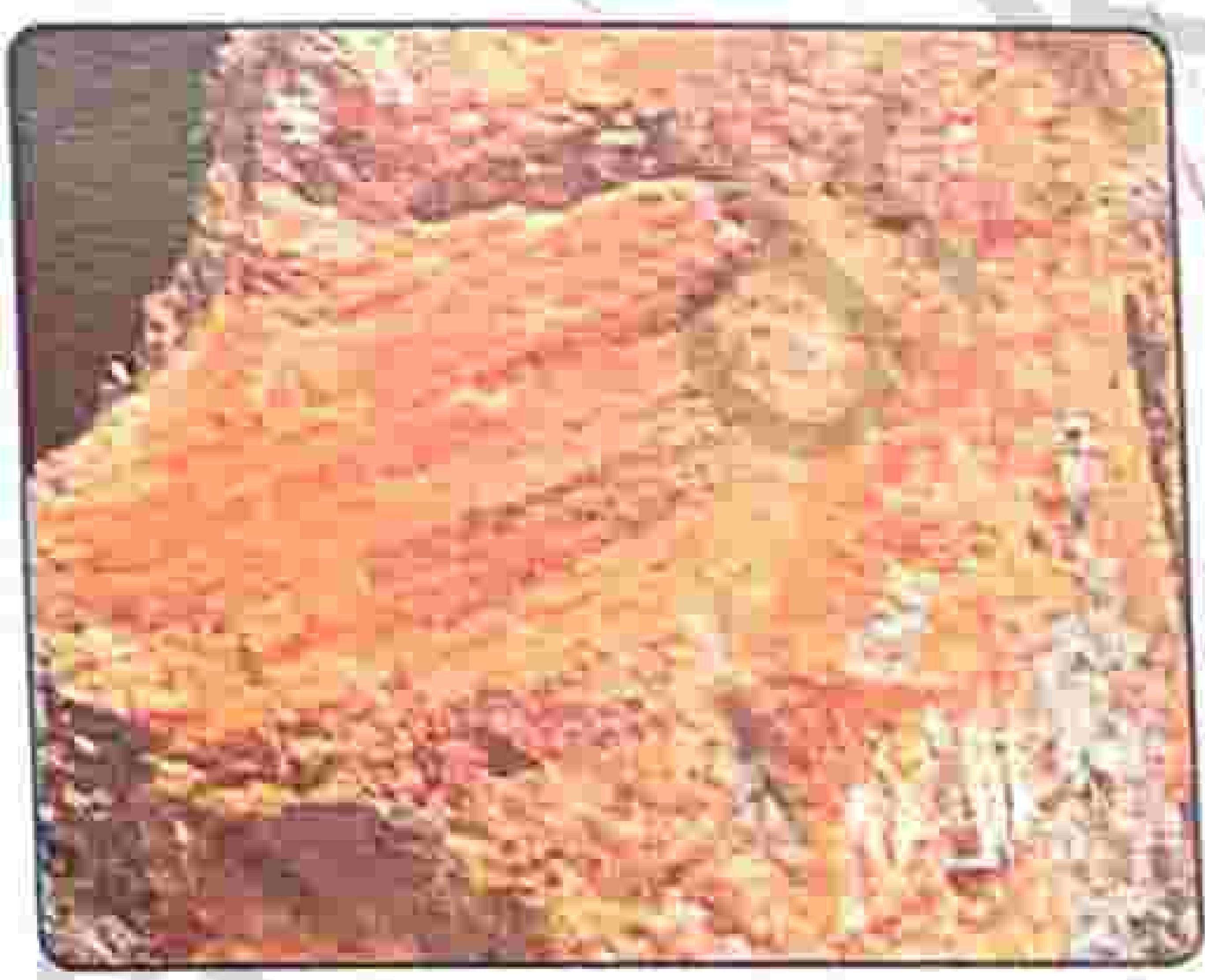
15. Añjana (Stibnites)



16. Kaṅkuṣṭha (Rhubarb)



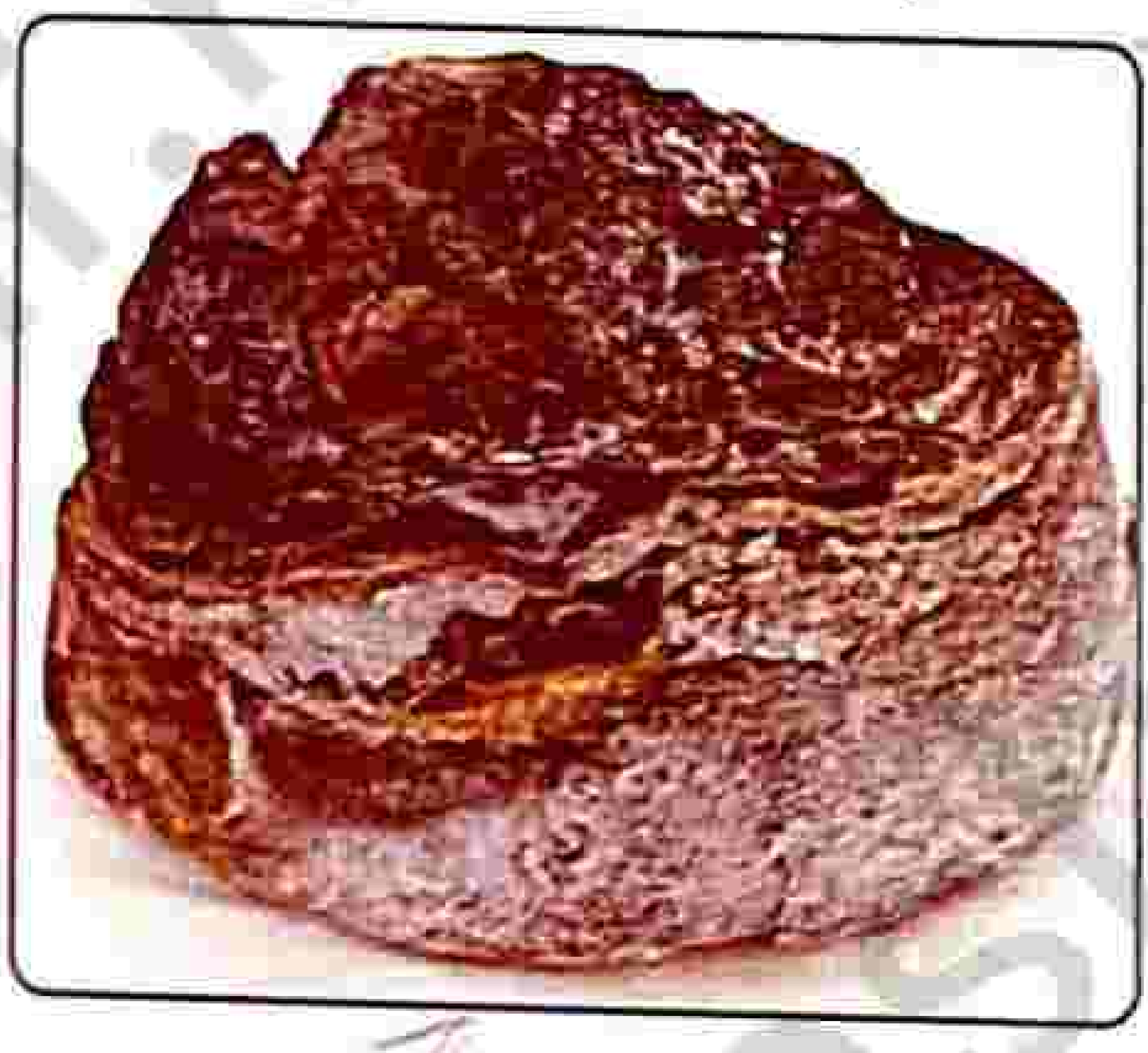
17. Kampillaka
(Mallotus phillippinensis)



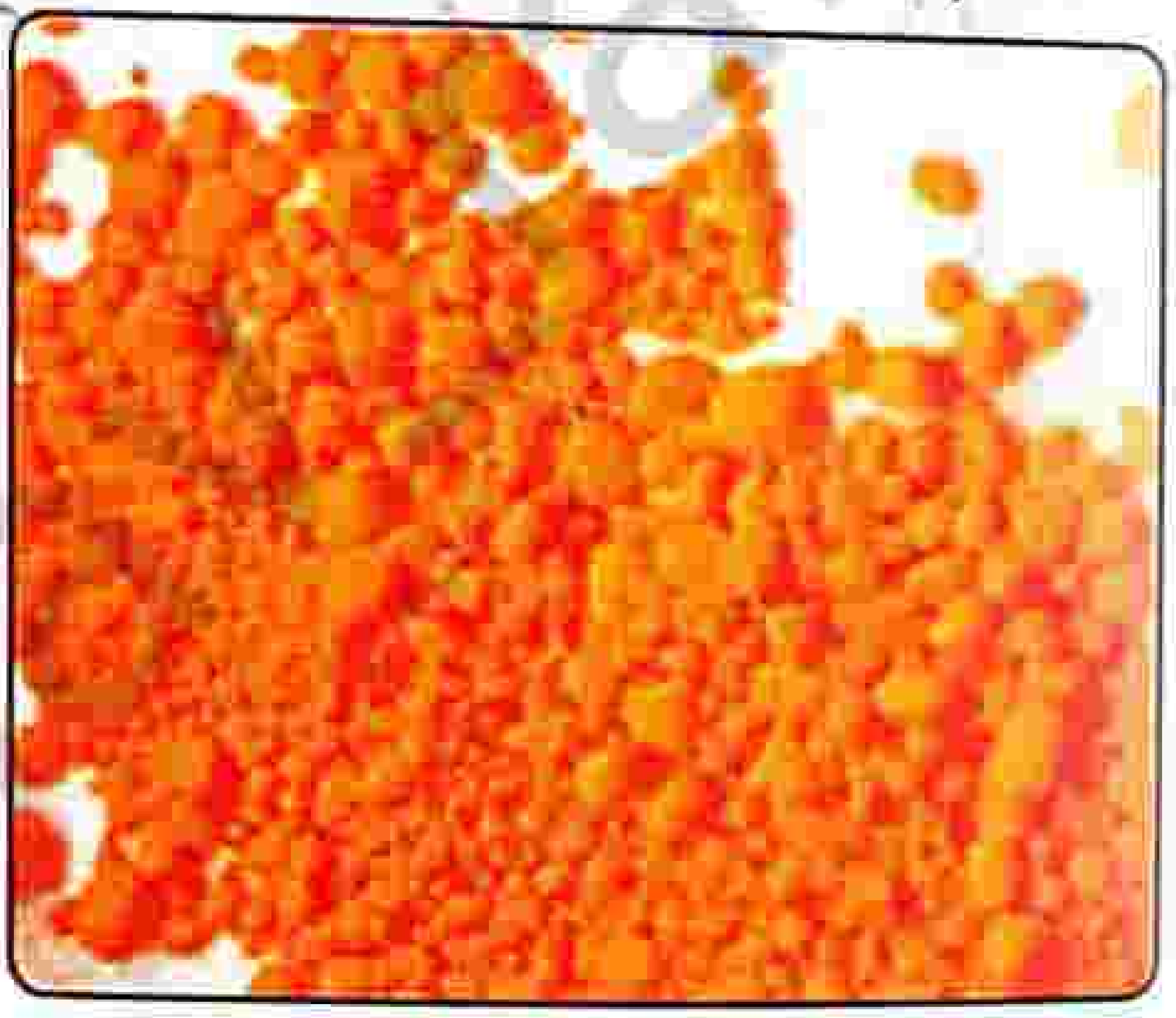
18. Gourīpāṣāṇa
(Arseneous trioxide)

19. Navasādara
(Ammonium chloride)

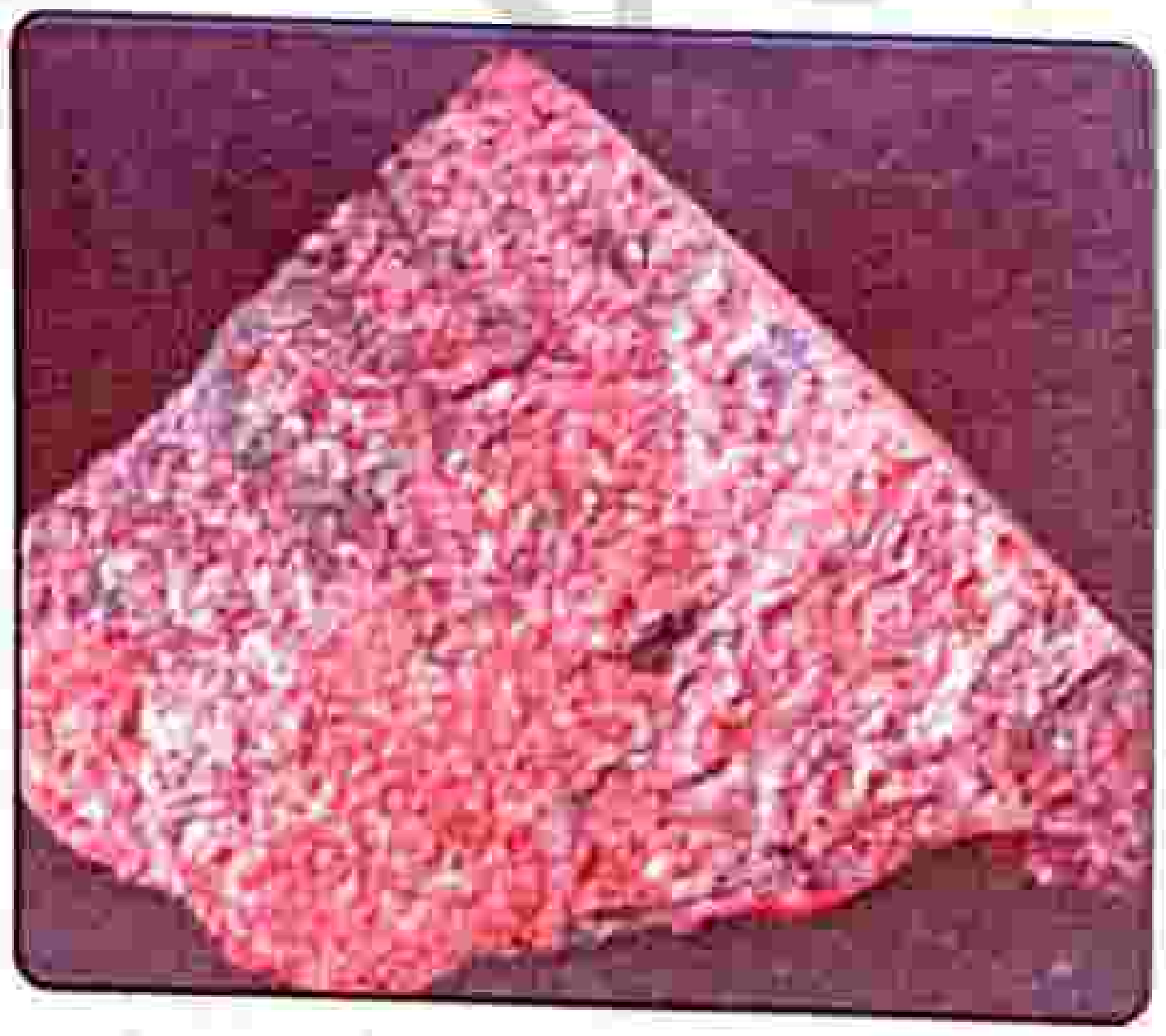
20. Kaparda
(Merine shells; Cowrie)



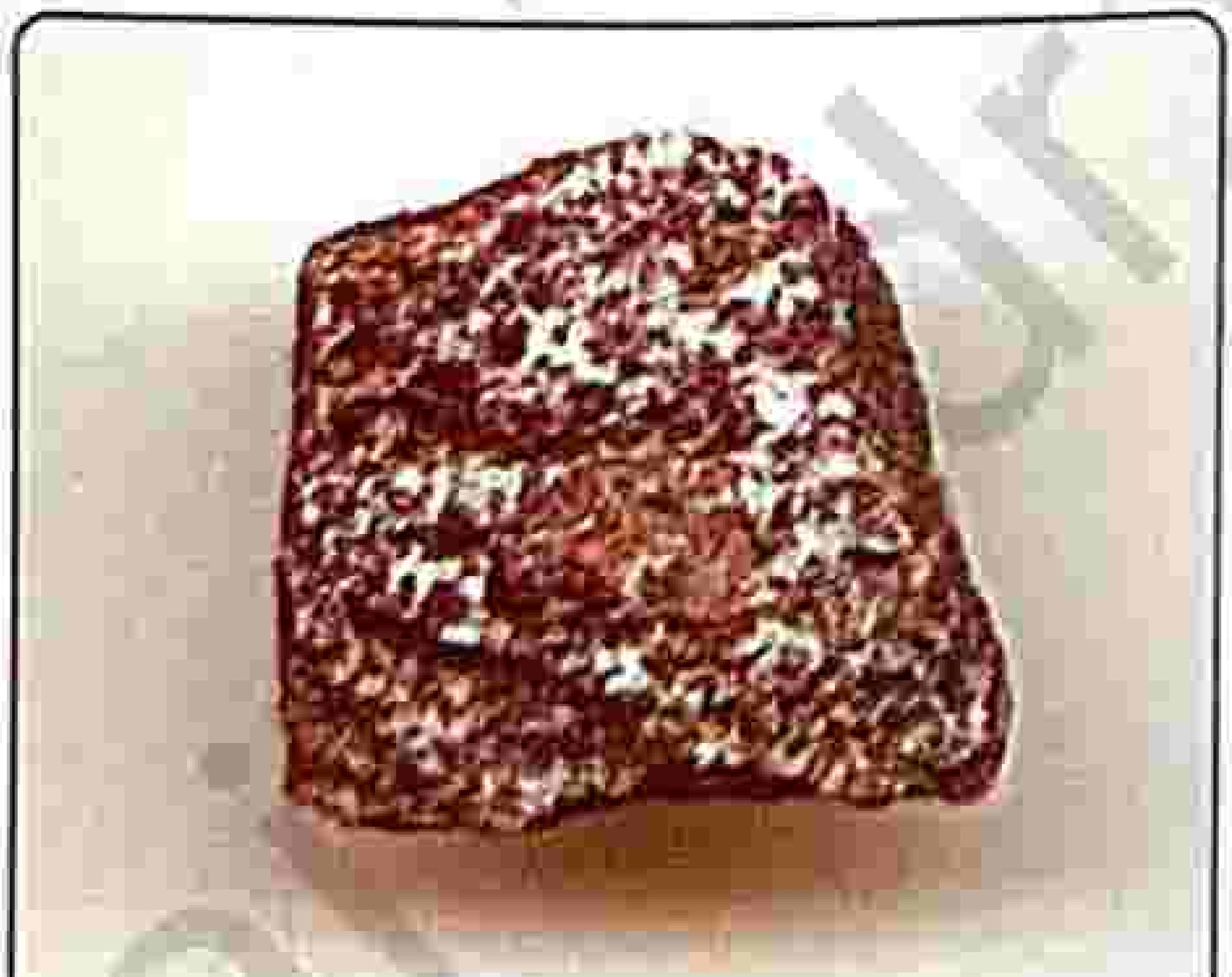
21. Vahnijāra (Agnijāra; Ambergris)



22. Girisindūra (Mercuric oxide)

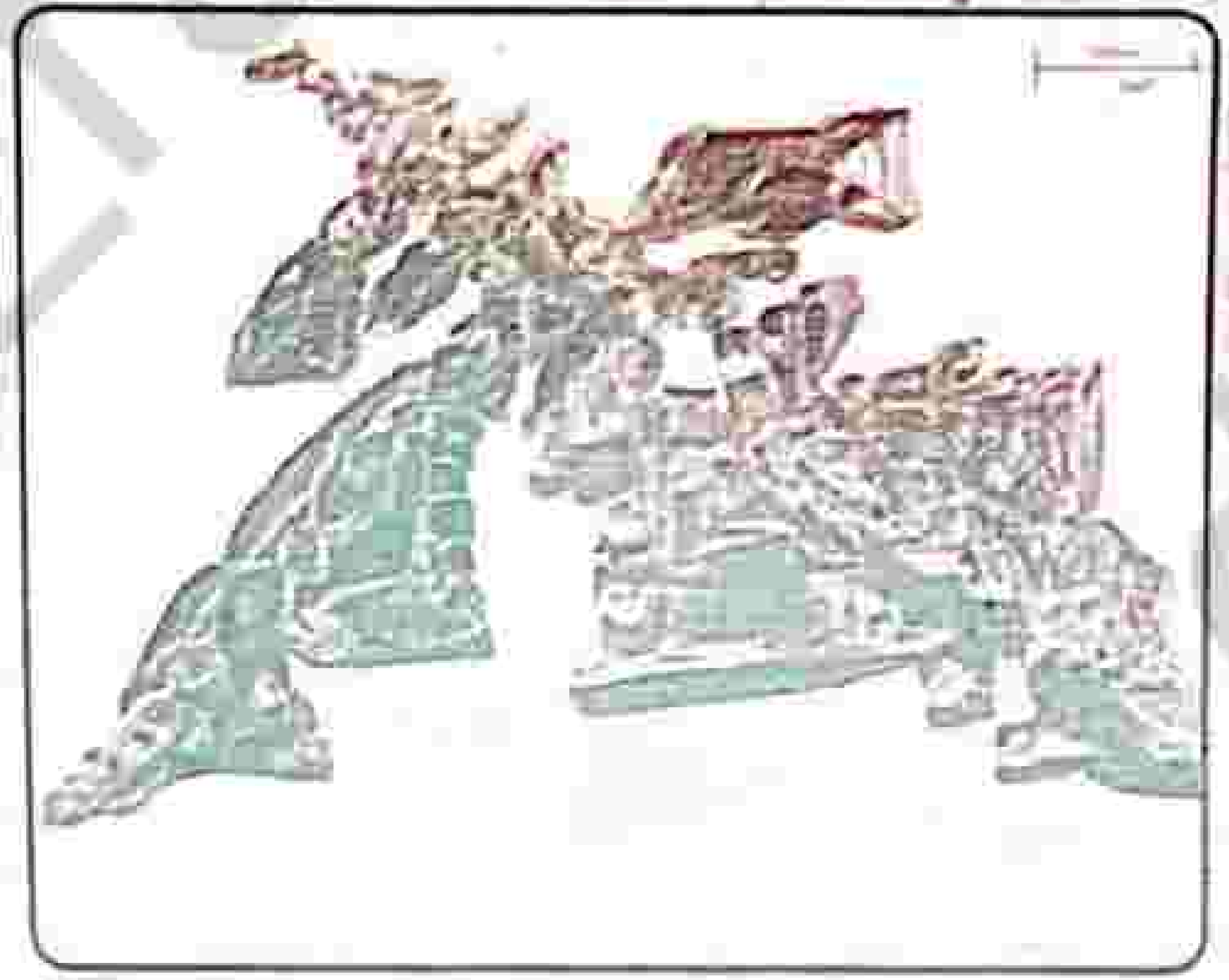


23. Hiṅgula
(Cinnabar; Sulphide of mercury)



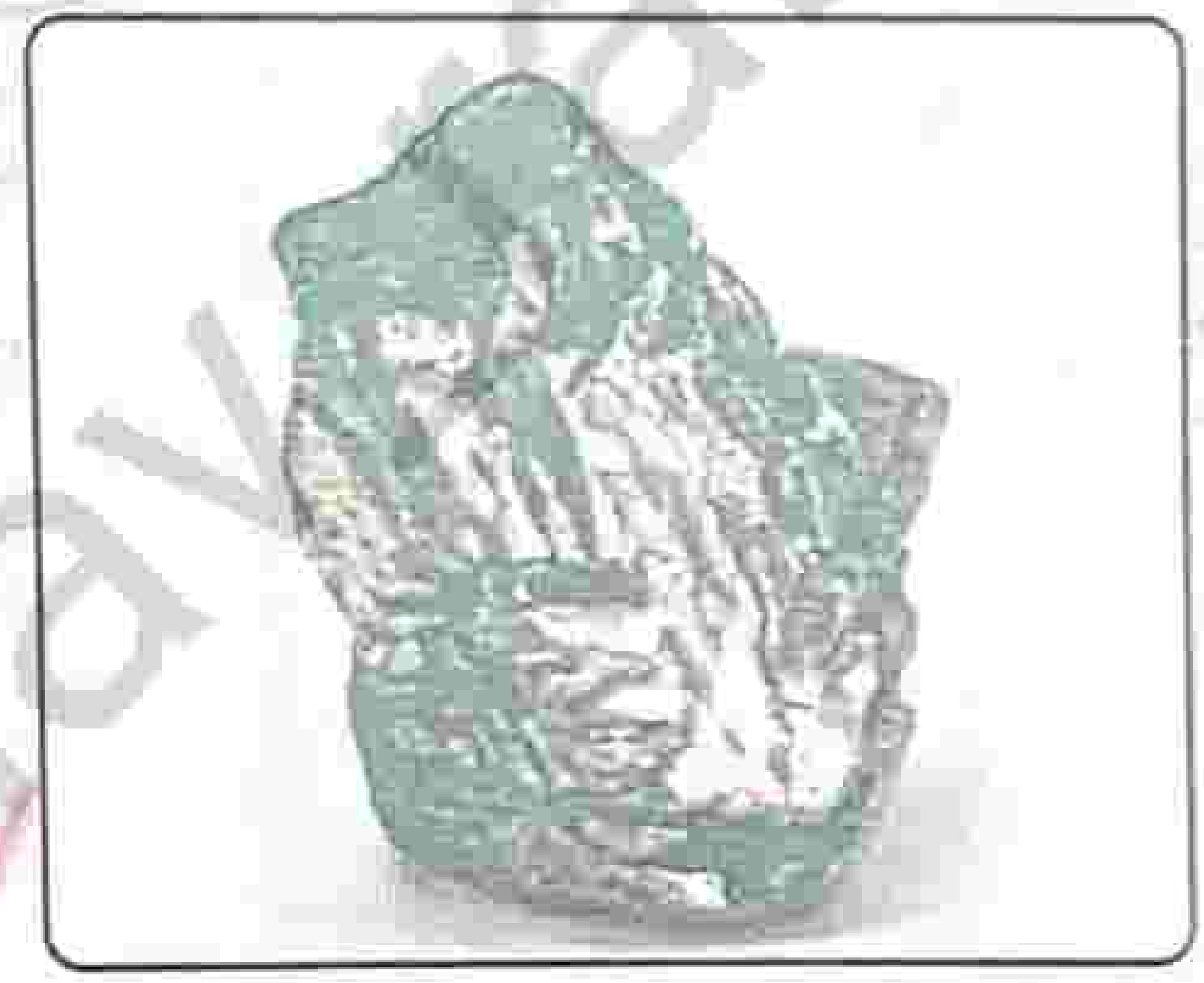
24. Mṛddāraśṛṅga
(Litharge; Lead monoxide)

25. Swarṇa (Gold; Aurum)



26. Rajata (Silver; Argentinum)

27. Tāmra (Copper; Cuprum)



28. Loha (Iron; Ferrum)

29. Nāga (Lead; Plumbum)

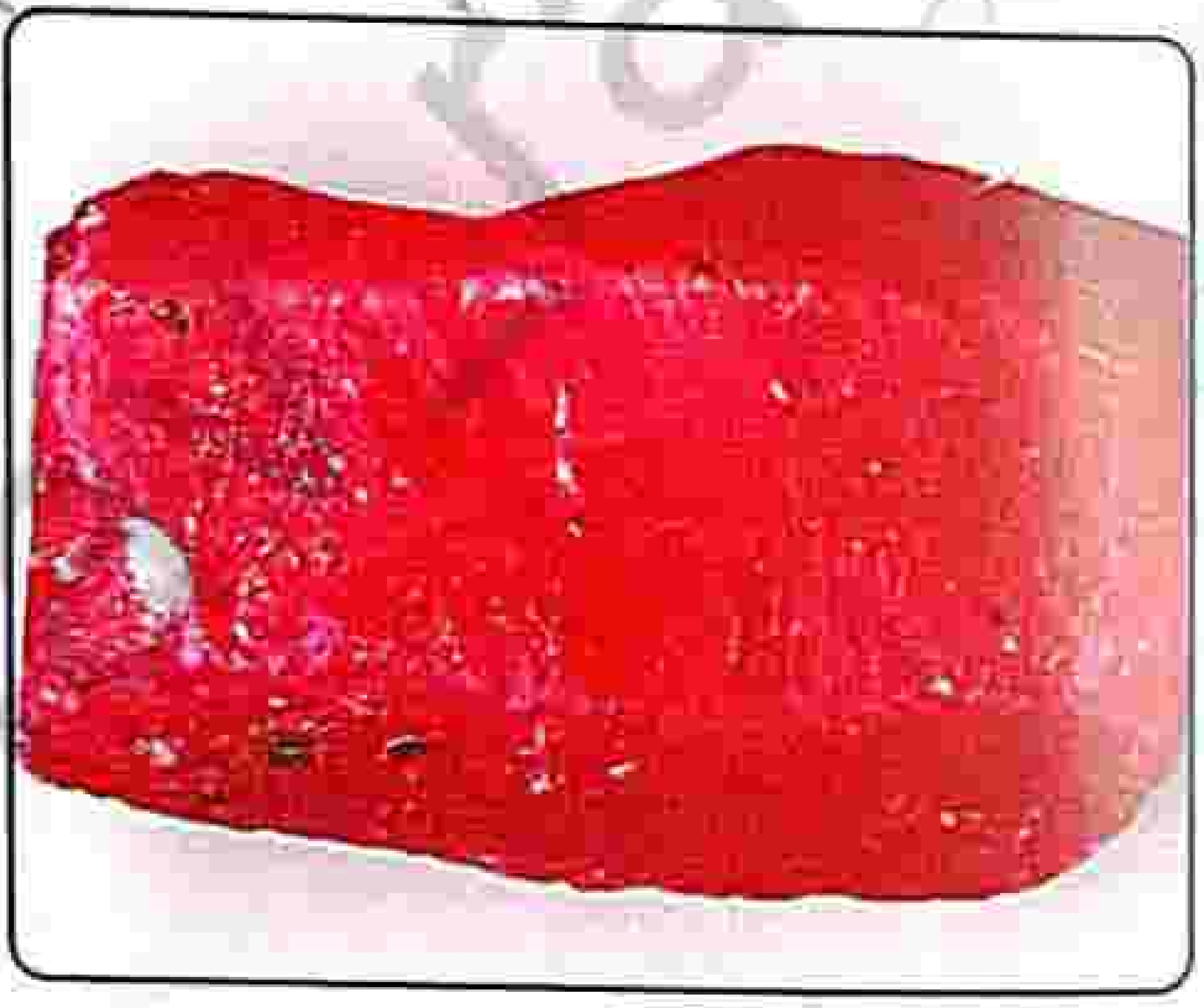
TIN
50
Sn
118.71
232°C
7.31 g/cc

30. Vaṅga (Tin; Stannum)

31. Pittala (Brass)

32. Kāṁsya (White copper)

33. Vartaloha (Bronge)



34. Māṇikya (Ruby)

35. Muktāphala (Pearl)

36. Pravāla (Vidruma; Coral)

37. Tārkṣya (Marakata; Emerald)

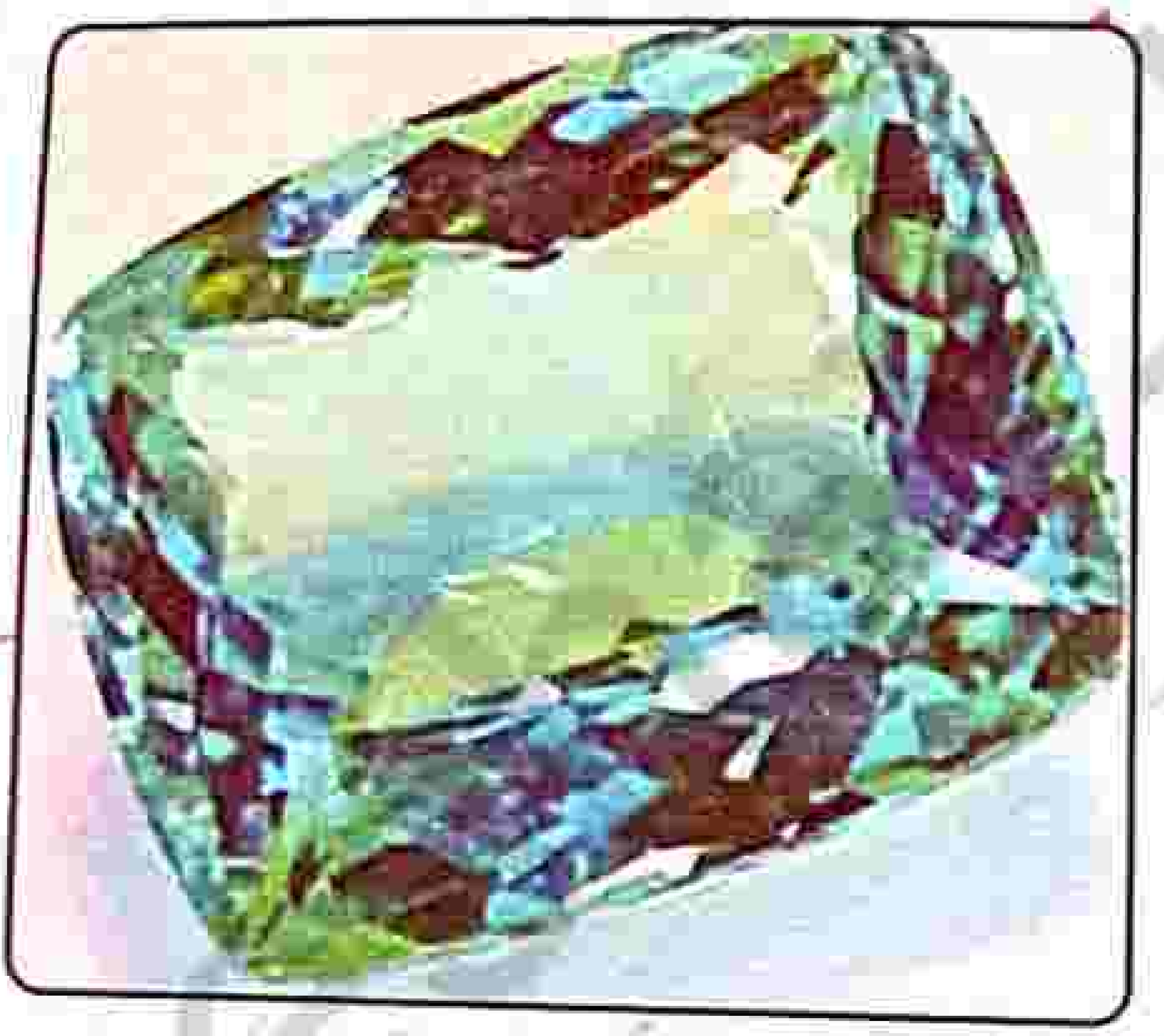
38. Puṣparāga (Topez)

39. Vajra (Bhidura; Diamond)

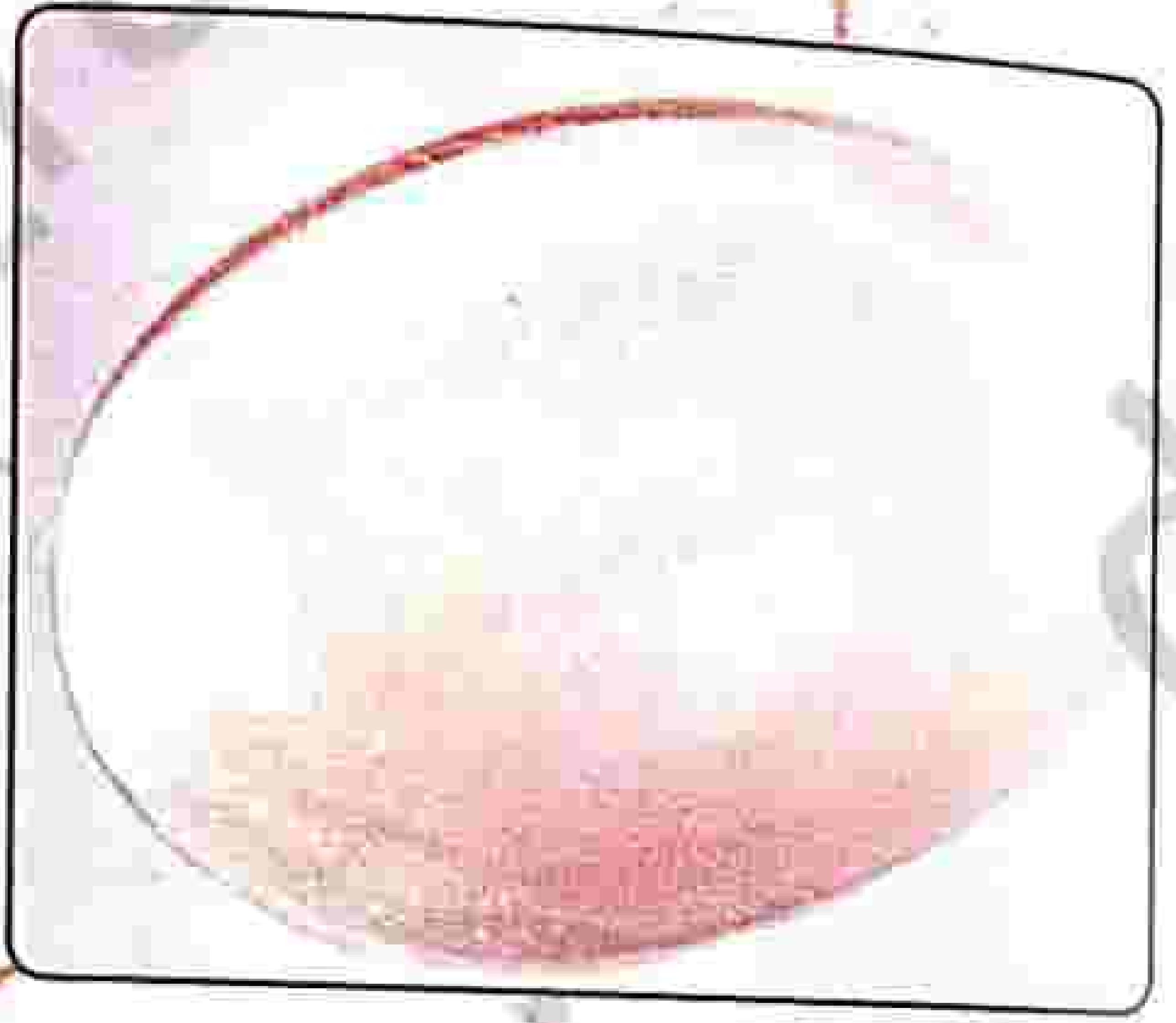
40. Nīla (Indranīla; Sapphire)

41. Gomeda (Zircon; Hessonite; Cinnamone stone)

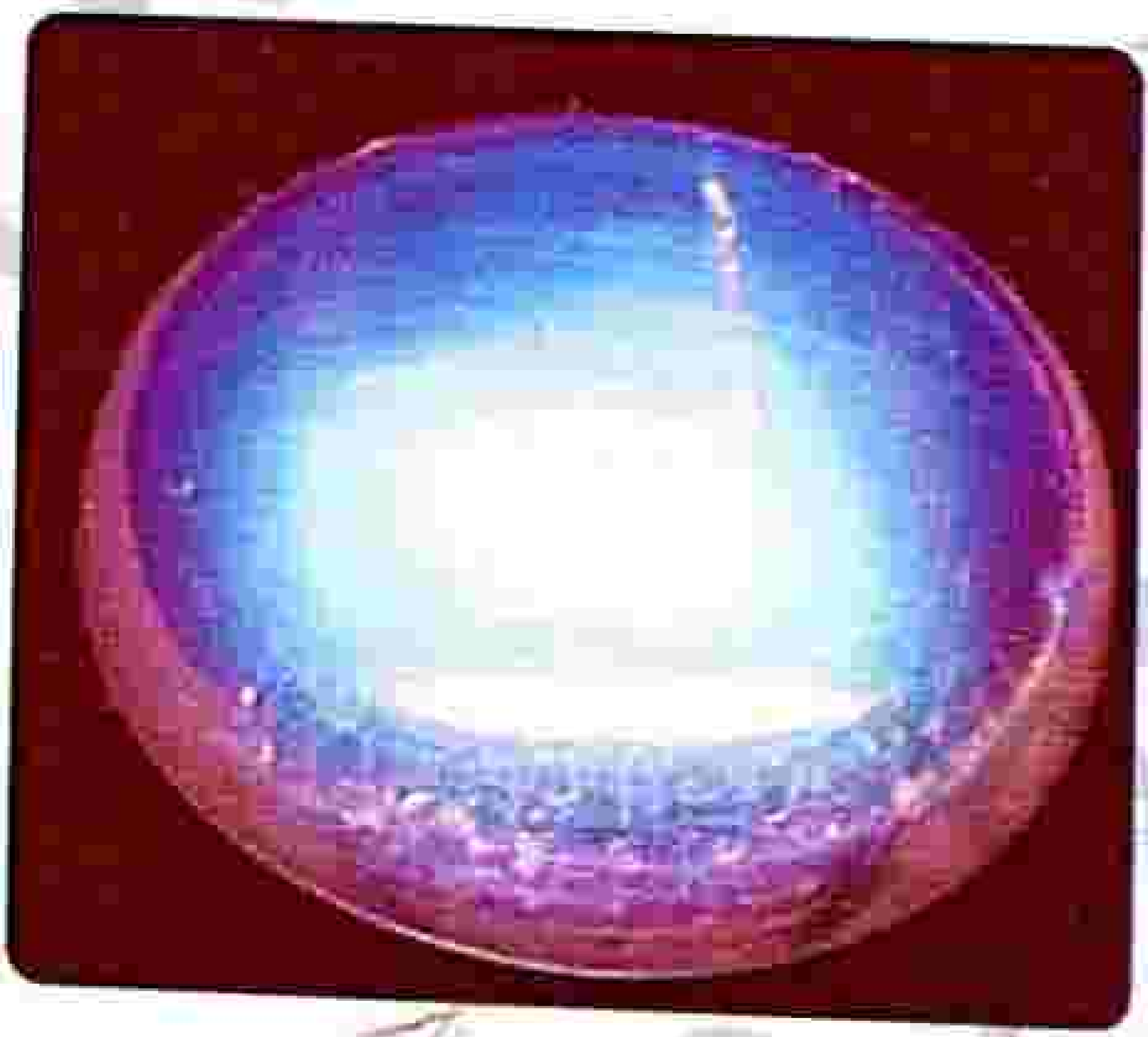
42. Vaiḍūrya (Cat's eye)



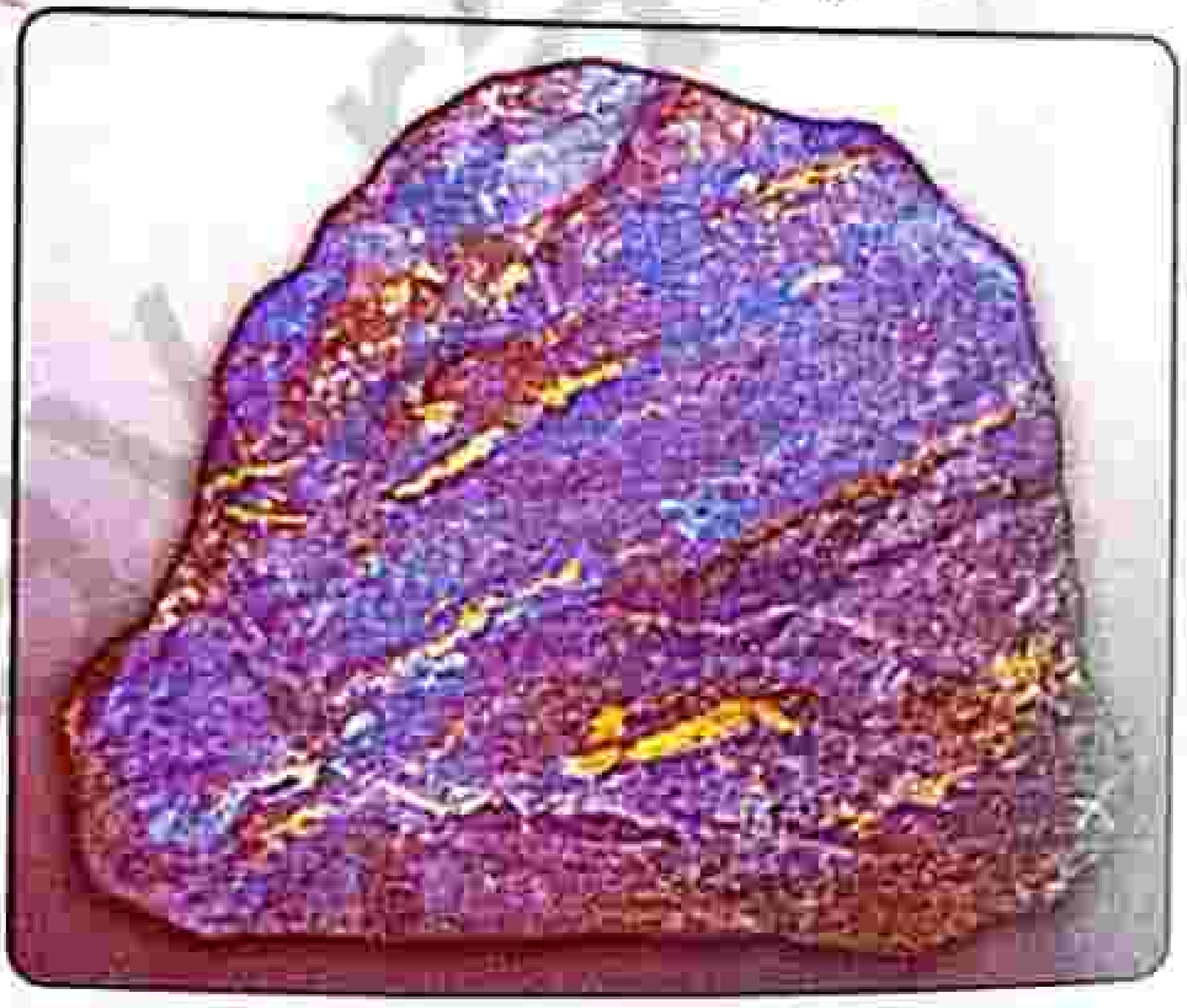
43. Vaikrānta (Tourmaline)



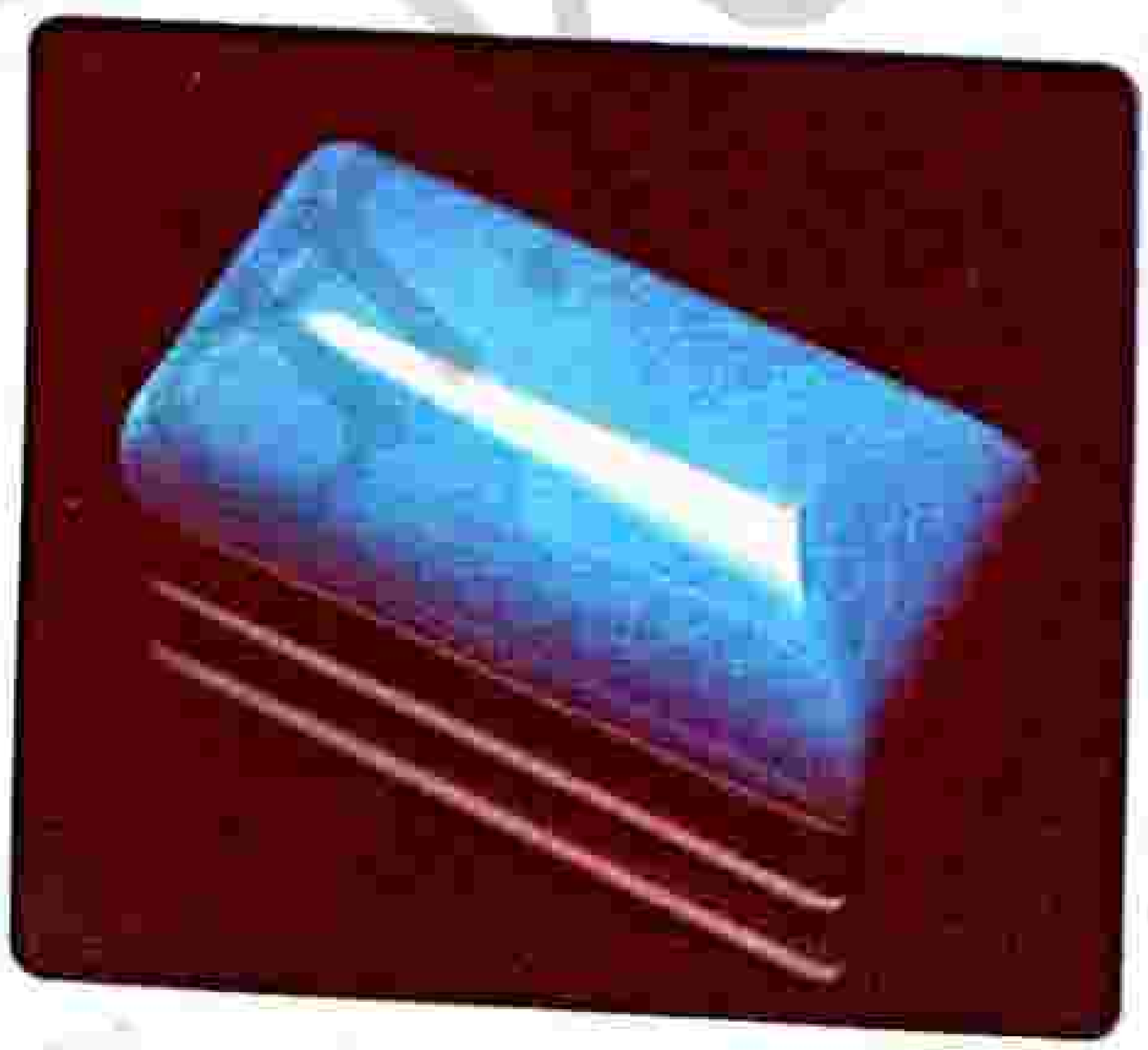
44. Sūryakānta
(Sun stone; Fledspar)



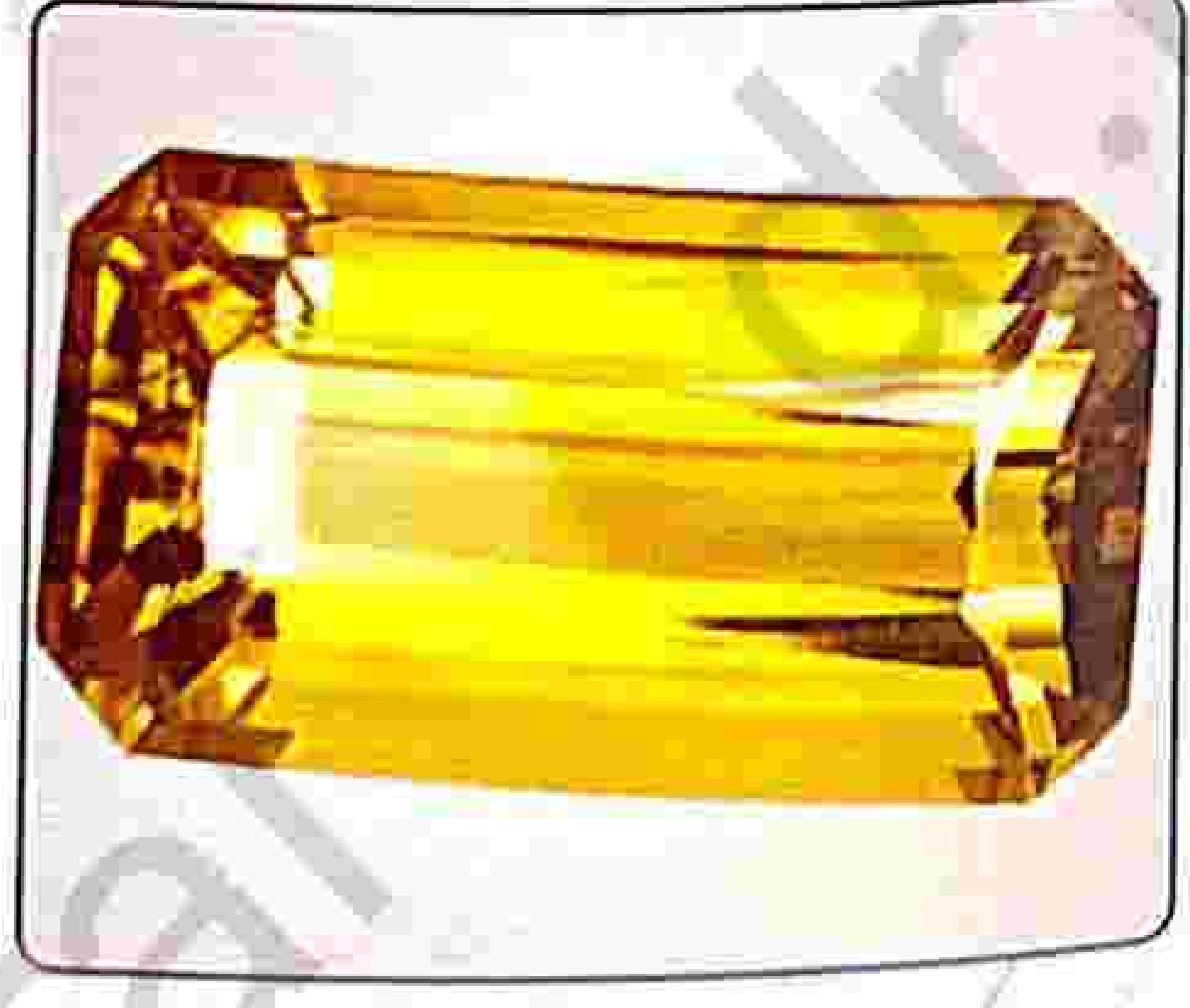
45. Candrakānta (Moon stone)



46. Rājāvarta
(Lapis lazuli; Altra marine)



47. Perojaka (Torquoise)



48. Sphaṭika (Quartz)

49. Vyomāśma (Jade)

50. Tṛṇakānta (Amber; Succinum)

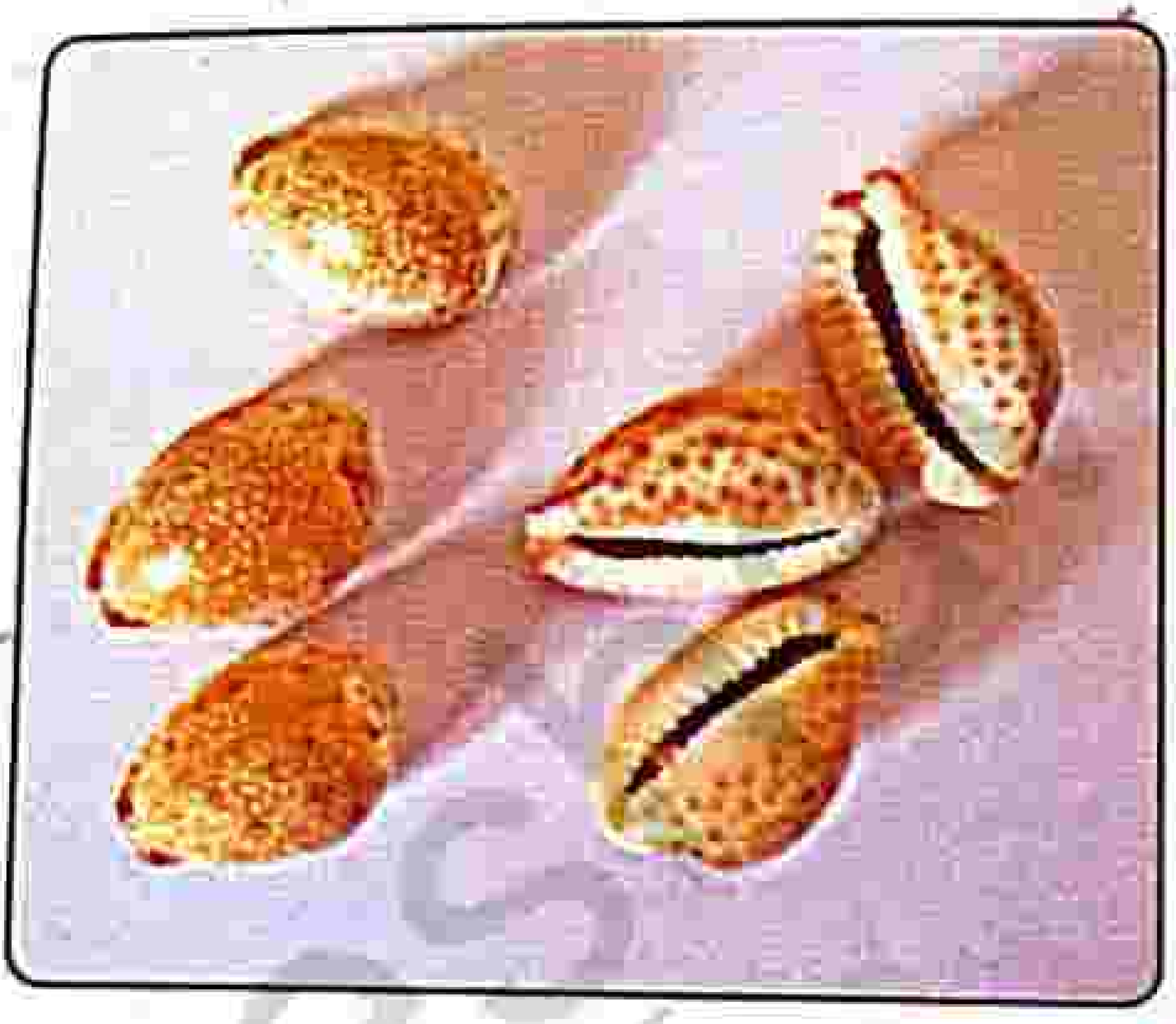
51. Palaṅka (Onyx)

52. Puttika (Peridot)

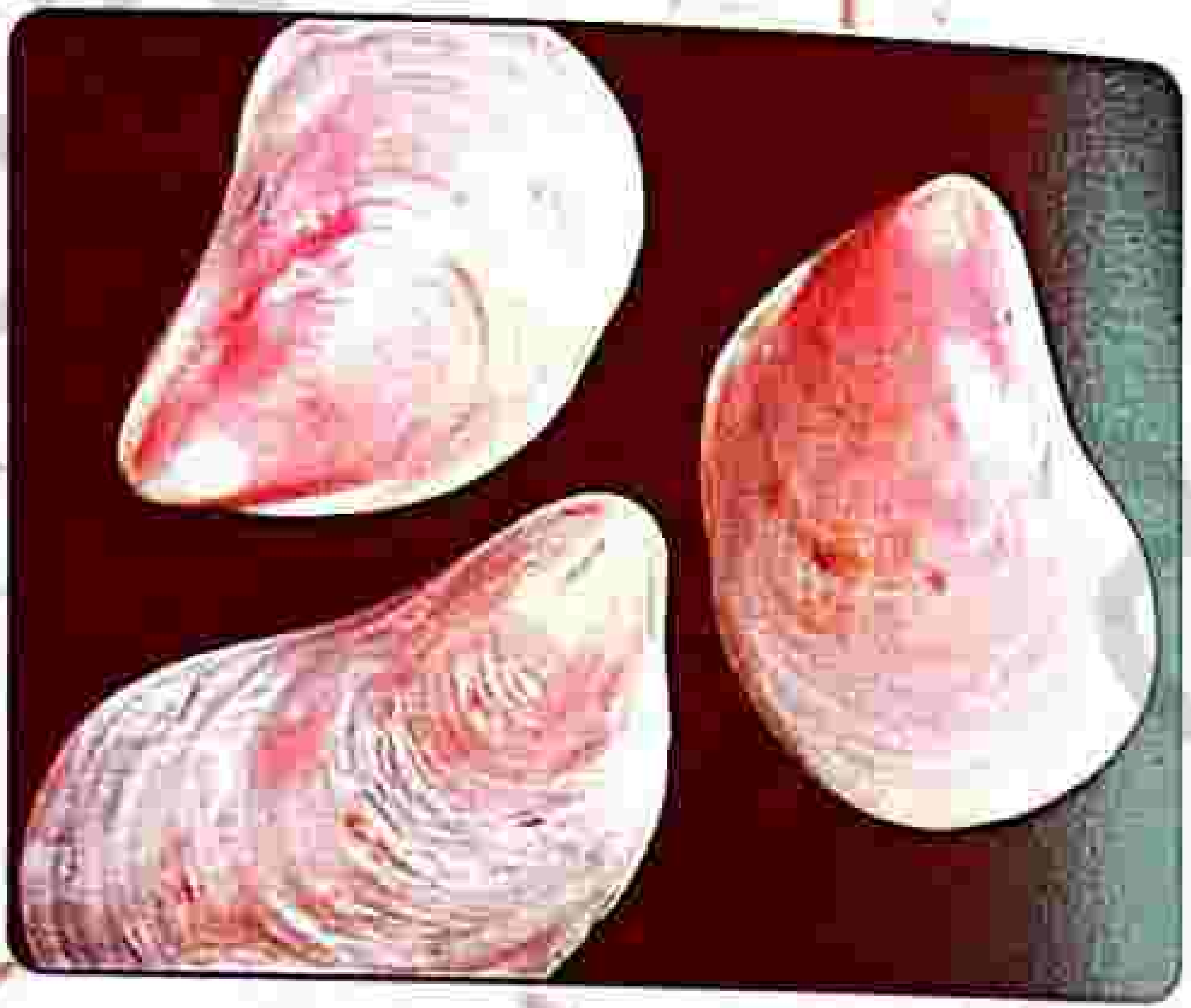
53. Rudhira (Carneline)

54. Sudhā (Calcium carbonate)

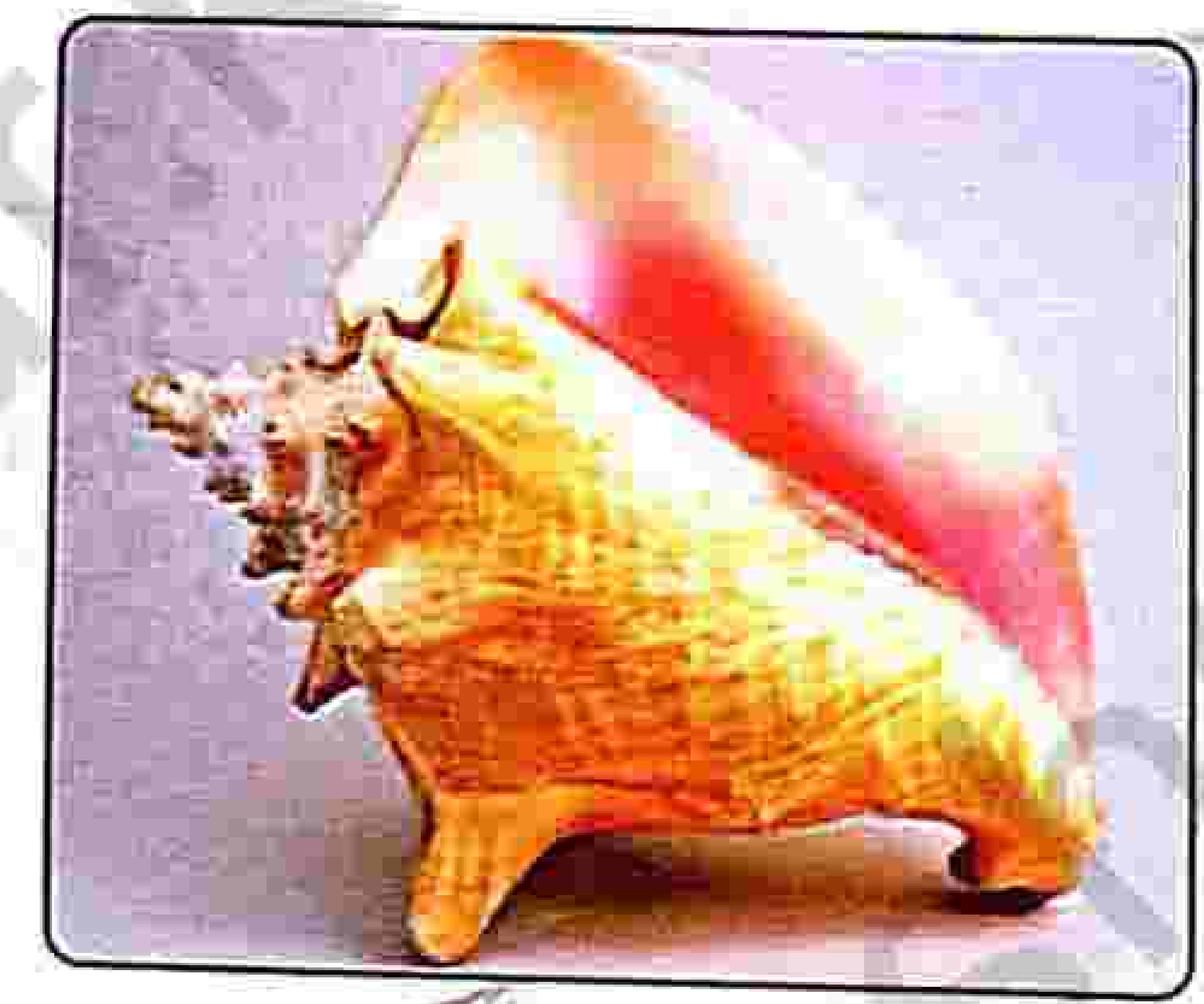
dr. keshav raj



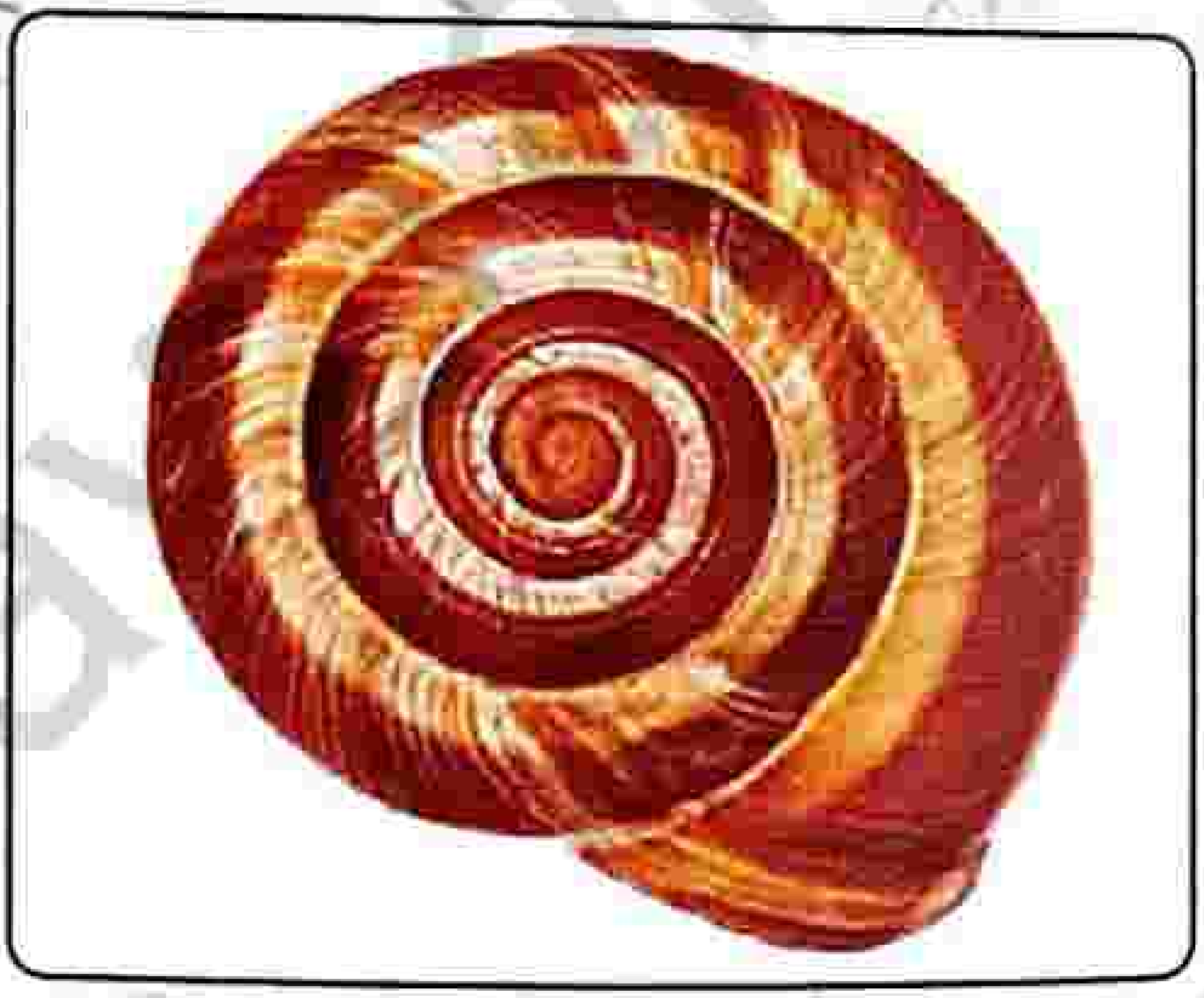
55. Varāṭikā (Kaparda; Cowry)



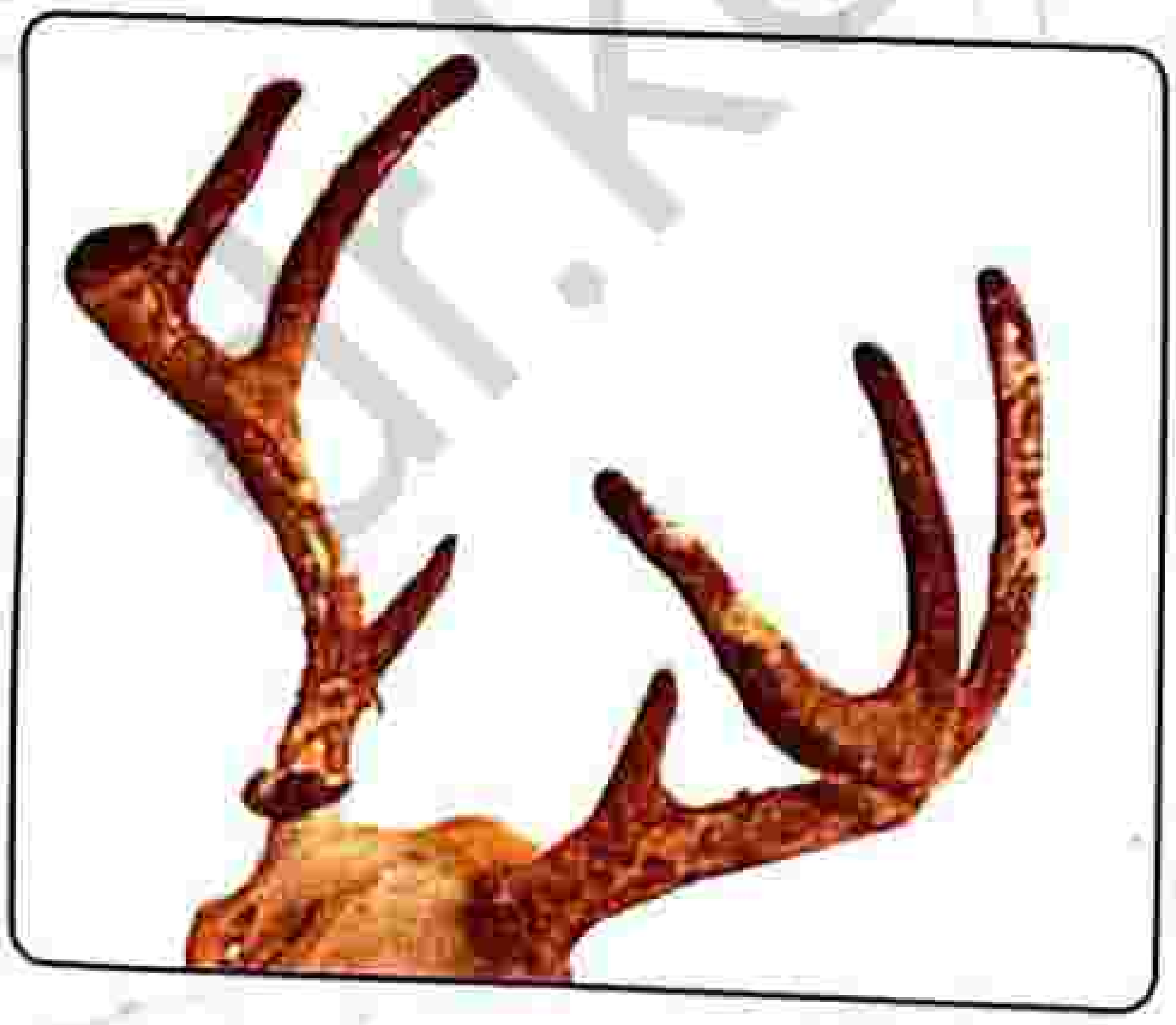
56. Śukti (Oyster shell)



57. Śaṅkha (Conch shell)



58. Śambūka (Pīla/Snail shell)



59. Mṛga-śṛṅga (Antlers)

60. Khaṭika (Pipe clay)

drkeshavraj drkeshavraj

61. Godantī (Gypsum)

62. Samudraphena
(Cuttlefish bone)

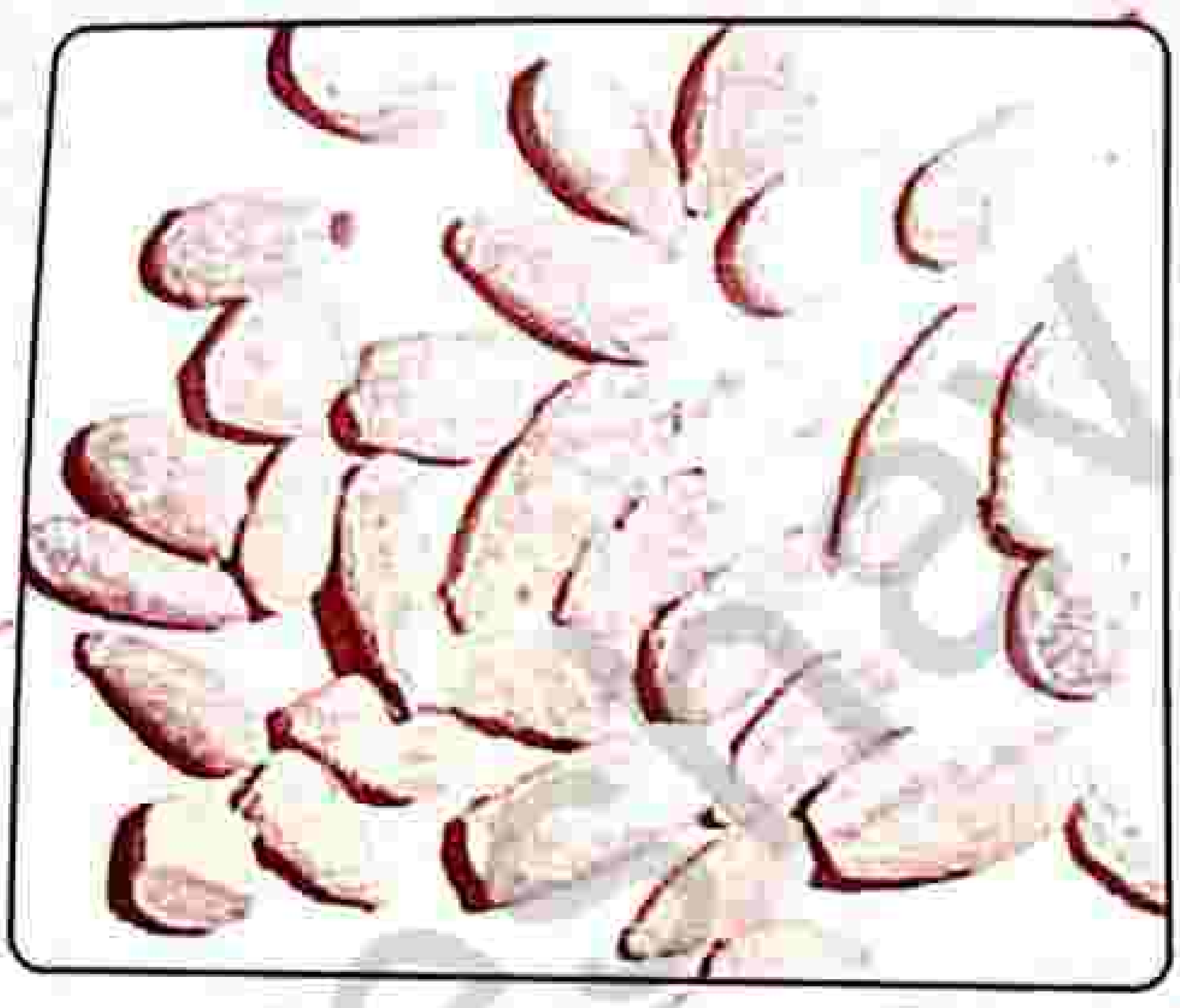
63. Kukkuṭāṇḍatwak
(Hen's egg shell)

64. Kūrmapṛṣṭhāsthi (Tortise bone)

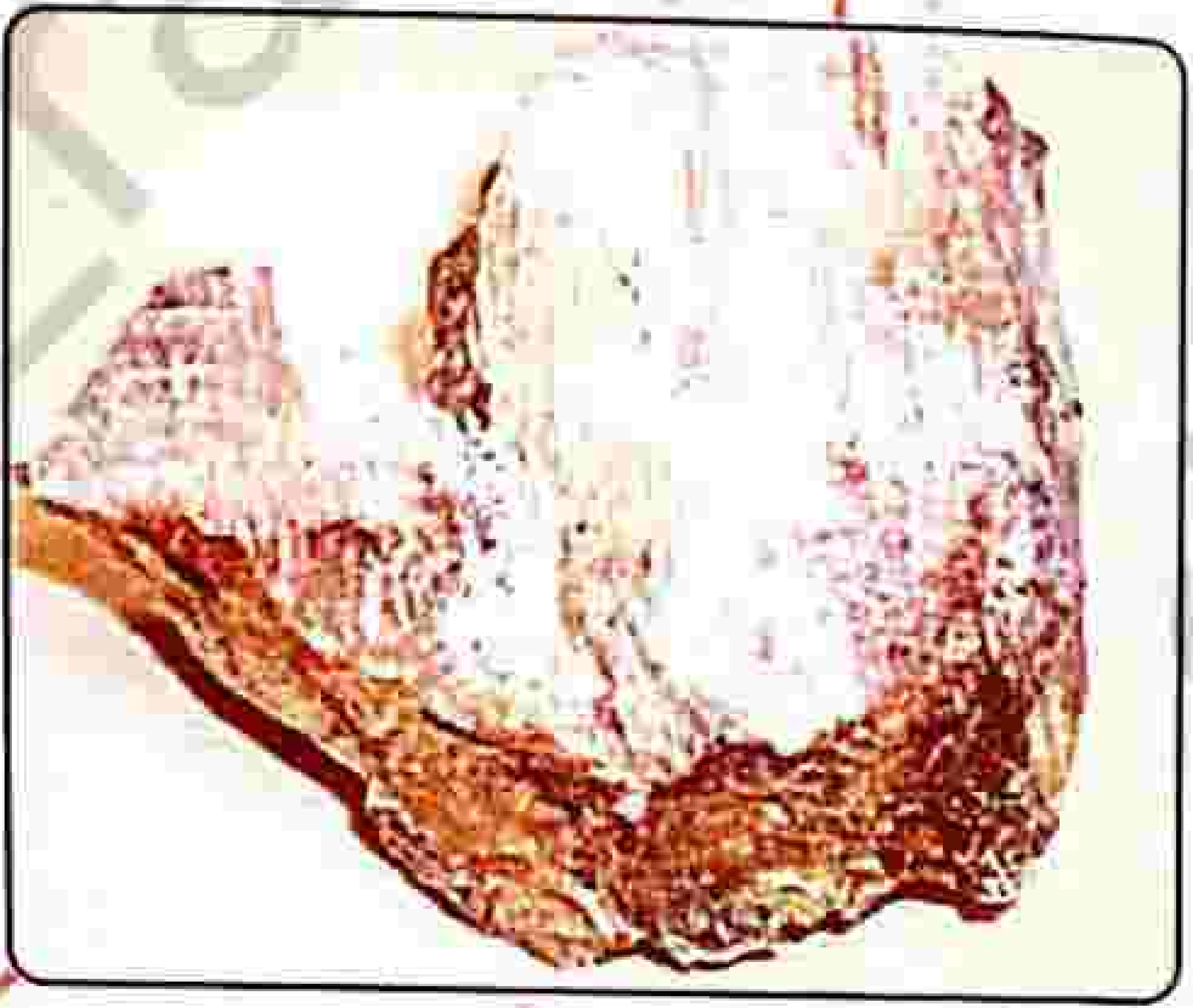
65. Ajāsthi (Goat's bone)

66. Śwetāñjana (Calcite)

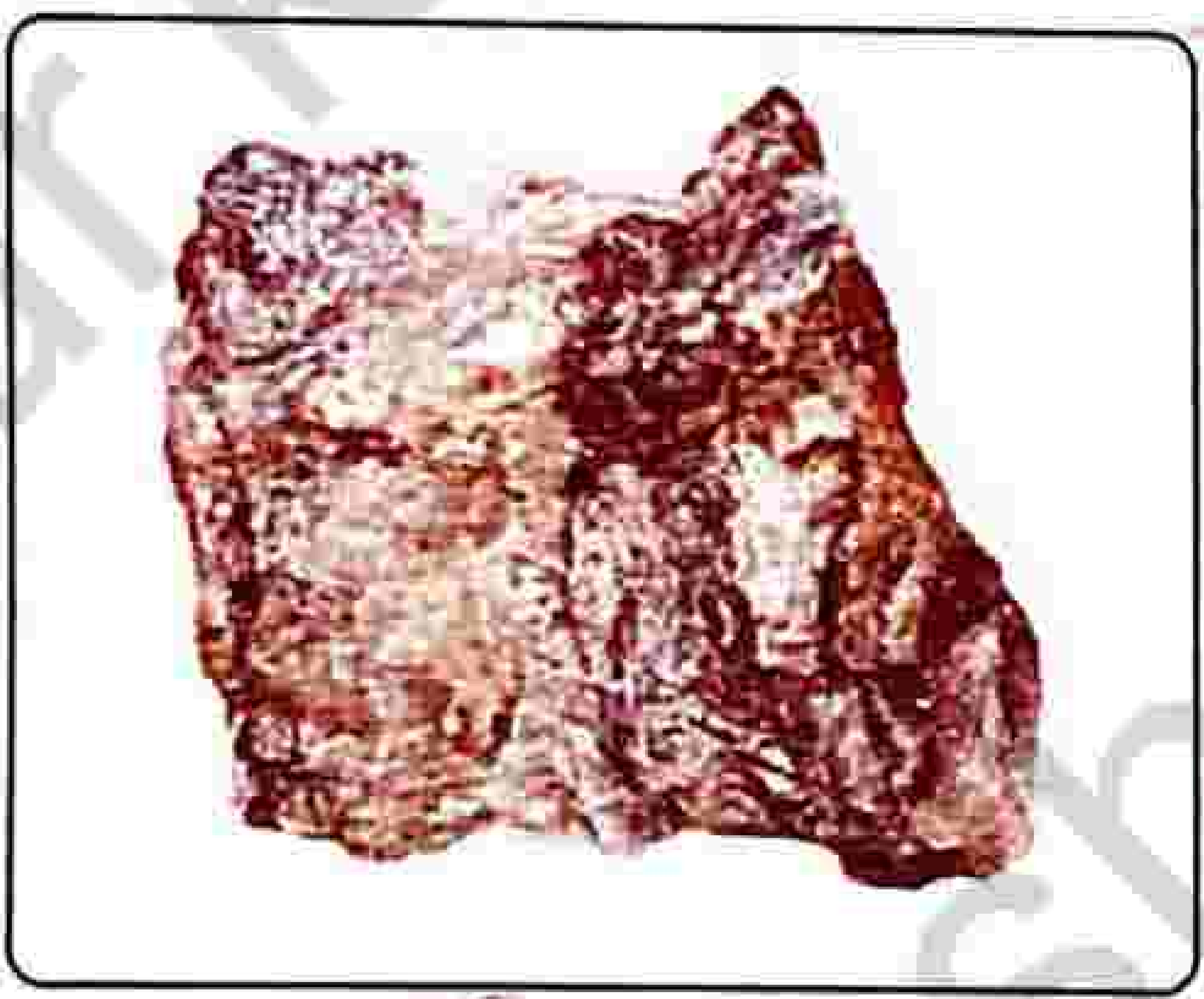
dr. keshav raj



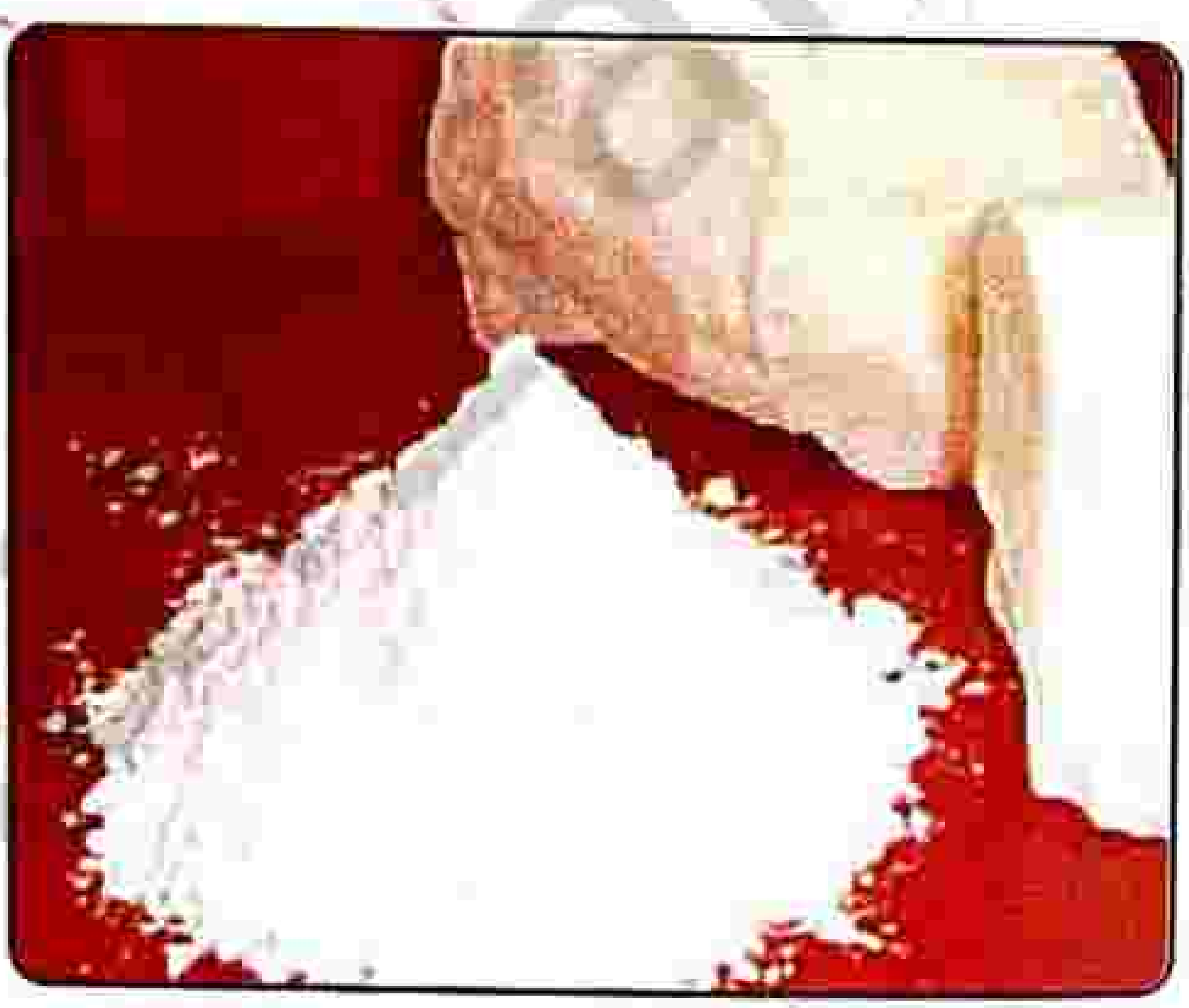
67. Badarāṣma (Silicate of lime)



68. Kouśeyāśma (Asbestos)



69. Nāgapāṣāṇa
(Magnesium silicate)



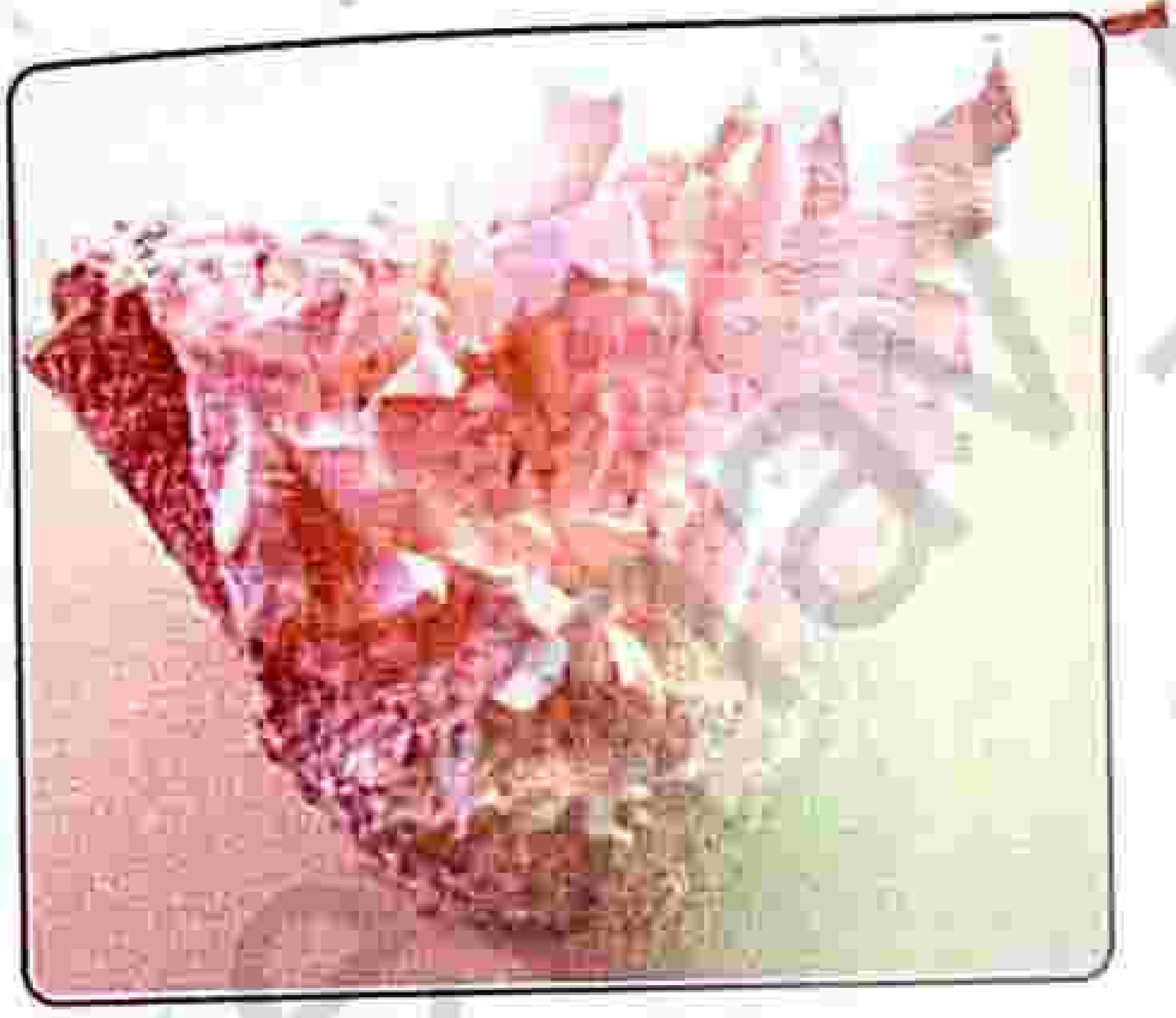
70. Dugdhapāṣāṇa (Talc)

SODIUM BICARBONATE
N.W.: 25 KG
G.W.: 25.2KG
MADE IN CHINA

71. Sarjakṣāra (Sodium bicarbonate)

GreenSense
POTASSIUM BICARBONATE

72. Yavakṣāra
(Potassium bicarbonate)



73. Ṭaṅkaṇakṣāra (Borax)

JointHope
GrowSoul
13-5-0-46

74. Sūryakṣāra
(Potassum nitrate; soraka)

◆

# ALPHABETICAL INDEX

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